



# **AST**

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## **COMPUTER**

### ***User Guide***

***Premmia***  
***PS Series***





### ***Disclaimer***

Although this guide has been carefully checked for accuracy, there may have been changes to the design and specification of the computer since the guide was printed. There are no warranties as to the accuracy of the information in this guide, and AST Computer cannot be responsible for any inaccuracies or omissions.

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As an ENERGY STAR® Partner,  
AST Computer has determined that this  
product meets the ENERGY STAR®  
guidelines for energy efficiency.



## Important Safety Instructions

For your protection and safety, please read these instructions thoroughly and pay strict attention to and follow all warnings and instructions.

1. Before cleaning the computer and monitor, be sure to disconnect them from AC power. Do not use any liquid or spray cleaners - wipe with a damp cloth only.
2. Do not use the computer if the environment you are working in is wet or overly damp.
3. The computer can only be operated within the voltage range specified on the power rating label. For information on the voltage range in your area, contact your electrical utility company.
4. The AC power cable should only be used to connect your computer to an electrical power supply. Make sure the outlet is easily accessible.
5. Unplug the computer from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - A. When the power cord is damaged.
  - B. If liquid has entered the computer.
  - C. If the computer does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the computer to normal operation.
  - D. If the computer has been dropped or damaged.
  - E. If the computer exhibits a distinct change in performance.
6. Do not use CD or DVD disks that are not perfectly round or are otherwise unbalanced. Due to the very high rotation speeds inside the CD and DVD drives, an unbalanced disk can cause vibration and malfunctions.





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## An Overview

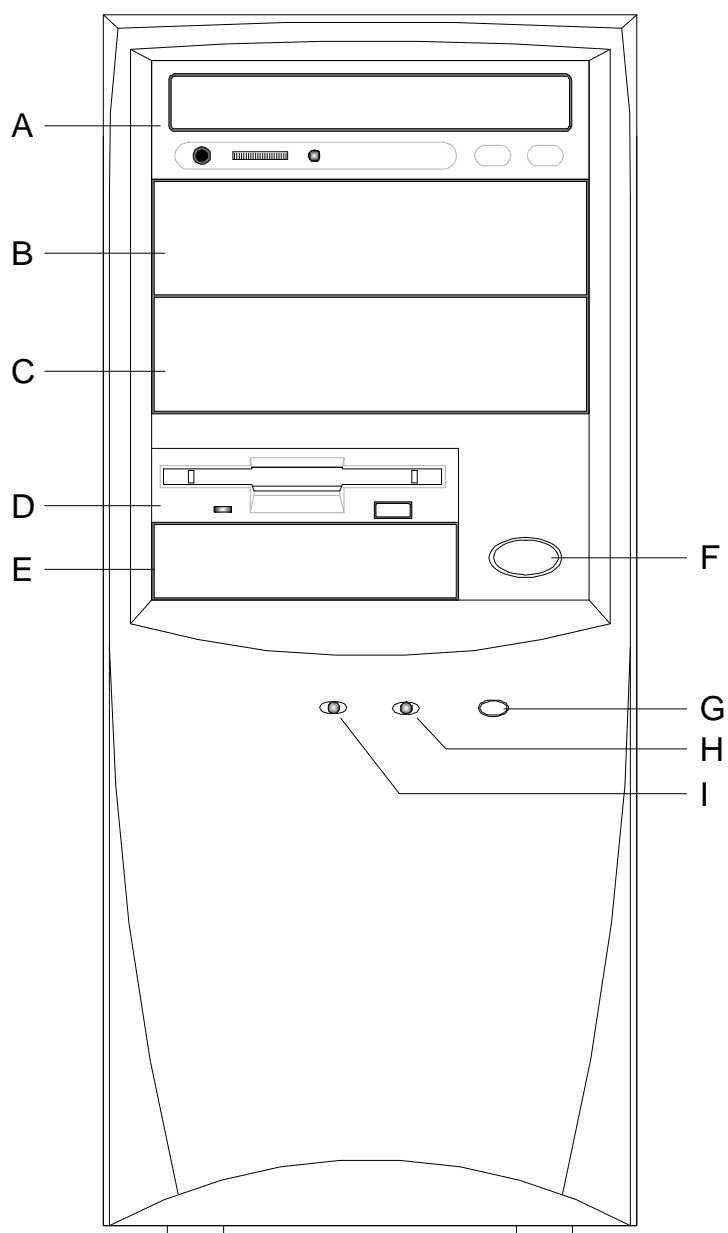
Your computer combines high-performance components in a design that meets multiple industry standards and supports most common operating systems (for example Microsoft® Windows 98® and Windows NT®) and applications (for example Microsoft Word or Excel, Internet browsers and email programs).

Getting the most out of your computer requires a good understanding of how the features of the computer work with the operating system and with applications. You should spend a few moments to review this user guide to get an idea of what your computer can do, as well as checking out the operating system and applications manuals to see how they work together.

The next few pages gives you a quick tour of the computer; the following sections have a more in-depth description of each feature.



***The Front of the Computer***{xe "Diskette drive"}{xe "Floppy diskette" \t "See Diskette drive"}{xe "CD-ROM drive"}{xe "DVD drive"}{xe "CDR-W drive"}{xe "Optical drive"}{xe "Reset button"}{xe "Front panel"}{xe "Drive bays"}{xe "Hard disk drive:LED"}{xe "Device bays"}{xe "Suspend mode"}{xe "Power LED"}{xe "Power button"}{xe "LS-120 drive" \t "See SuperDisk drive"}{xe "Zip drive"}



A	5.25" device bay (CD-ROM drive shown)	Usually contains the optical drive, see page 30 for more details.
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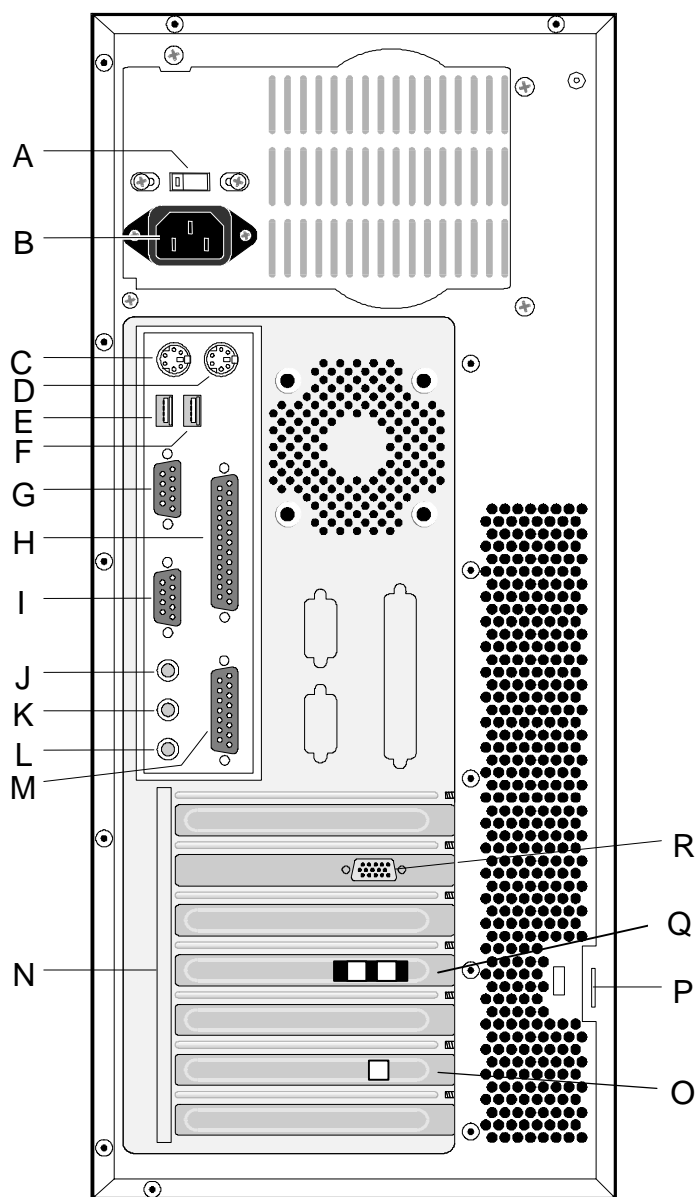
B C	5.25" device bays	If you ordered a tape drive with your computer, it is installed here; see page 35 for more details on using the drive. See page 46 for details on installing devices here.
D	3.5" diskette drive	A standard diskette drive or a SuperDisk™ drive, see page 26 for more details.
E	3.5" device bay	If you ordered a Zip™ drive with your computer, it will be installed here; see page 36 for more details on using a Zip drive. See page 46 for details on installing a drive here.
F	Power button	Use this to turn the computer on, turn it off, and put it into power-saving Standby mode; see page 18 for more details.
G	Reset button	Only use this if the computer seems to have stopped working; see page 22 for more details.
H	Power LED	Lights when the computer is turned on.
I	Hard drive LED	Lights when the hard disk is being accessed, do not turn off or reset the computer when this is lit.





***The Back of the Computer***{xe "AC voltage switch"}{xe "AC connector"}{xe "PS/2"}{xe "Mouse"}{xe "Keyboard"}{xe "USB"}{xe "Serial ports"}{xe "Parallel port"}{xe "Printer port"}{xe "Video:port"}{xe "Graphics port"}{xe "Game port"}{xe "Audio"}{xe "Microphone"}{xe "Speaker port"}{xe "Option cards"}{xe "MIDI port"}{xe "Padlock"}{xe "Security:Padlock"}{xe "MIDI port"}{xe "Modem"}{xe "Network card"}{ XE "LAN:card" }







A	AC voltage selection switch	Use this to set up the computer to accept 110V or 220V AC power; you should not need to change this, but if you do, refer to page 18 for more details.
B	AC power inlet	Connect the AC cable here.
C	Keyboard port	Connect the keyboard here; see page 27 for more details.
D	Mouse port	Connect the mouse here; see page 27 for more details.
E F	USB ports	Connect USB devices here; see page 35 for more details.
G	Serial port A	Connect serial devices here; see page 35 for more details.
H	Parallel port	Connect parallel devices, such as a printer here; see page 32 for more details.
I	Serial port B	Connect serial devices here; see page 35 for more details.
J	Audio input	Connect external audio sources, such as a radio or VCR here; see page 26 for more details.
K	Audio output	Connect your speakers here; see page 26 for more details.
L	Microphone input	Connect an external microphone here; see page 26 for more details.
M	MIDI/Game port	This port can be used to connect a joystick/gaming device or a MIDI audio device; see page 28 for more details.
N	Option card slots	Used to add option cards; see page 54 for details.
O	Network card	This optional card is used to connect to a local area network; see page 29 for more details.
P	Padlock loop	Use this to restrict access inside your computer; see page 32 for details.
Q	Modem card	This optional card is used to connect to a telephone line; see page 28 for more details.
R	Monitor connector	Connect your monitor here; see page 36 for more details.





## **Ergonomic Considerations{x "Ergonomics"}{xe "Carpal Tunnel Syndrome"}**

Any physical activity, repeated frequently over a long period of time, may pose a risk of serious injury. Some nerve, tendon and muscle disorders may be associated with repetitive activities, improper work environments and incorrect work habits. Although some studies have shown an association between long-term use of a keyboard and the development of nerve, tendon and muscle disorders such as Carpal Tunnel Syndrome, it is still unclear whether working at a computer causes these disorders.

We've designed your computer to be as easy to use as possible, but please follow the guidelines in this section to reduce the risk of injury.

If you do experience pain, tenderness, swelling, burning, cramping, throbbing, weakness, soreness, tingling and/or numbness anywhere in your body, please contact a doctor. If you do have to work on your computer for long periods of time, make sure you vary your tasks throughout the day, and take frequent breaks - get up and stretch, walk around.

### ***Arrange Your Work Environment***

Arrange your work environment so that you are working in an easy and relaxed position.

#### **Get Seated**

Adjust your chair according to the following guidelines:

- Keep your body in a relaxed, upright position; make sure the back of your chair supports the inward curve of your back.
- Use the entire seat and backrest to support your body. The angle between your back and thighs should be 90° or greater.
- Place your feet flat against the floor. Extend your lower legs slightly so that the angle between your upper and lower legs is greater than 90°.





## **Typing**

When you use the keyboard, follow these guidelines:

- Adjust your seat height so that your elbows are near to your body and your forearms are parallel to the floor. If your chair has armrests, try and use these to support your arms.
- Type with your wrists straight and your hands floating above the keyboard. Lower your wrists only between typing to rest them.
- Try to avoid bending your wrists, hands or fingers sideways; if you have to press a hard-to-reach key, move your entire arm.
- Keep your shoulders, arms, wrists and hands relaxed. Type gently; don't bang the keys.

## **Viewing the Monitor**

Use the following guidelines to reduce eye, shoulder and neck stress:

- Position the screen so that it is at 90° to windows, ceiling lights or other light sources.
- Adjust the brightness and contrast to enhance readability.
- Set up the resolution and icon and font sizes so that you can read things easily.
- Clean the screen regularly.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.



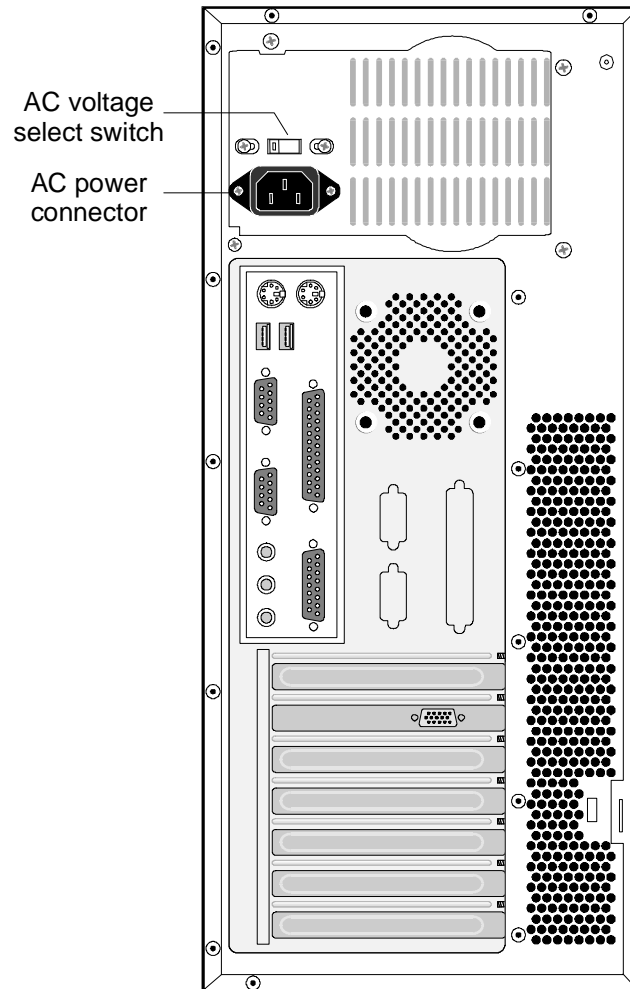


## Turning the Computer On and Off

### ***Powering the Computer{xe "AC voltage switch"}{xe "AC connector"}{xe "Power supply"}***

On the back of your computer, just above the AC power connector, is the AC voltage selection switch. The switch has two settings, depending on the AC supply: 115 VAC (from 100 to 127 VAC) and 230 VAC (from 200 to 240 VAC). Check with your utility company for the correct range.





## ***Turning On the Computer******{xe "Turning on the computer"}{xe "POST"}***

The back of your computer has a lot of ports that you can use to connect external devices such as the keyboard and mouse, printers, scanners and so on. However, the only ports to which you can connect external devices when the computer is turned on are the two USB ports. Devices that use other ports must be connected before you turn on the computer; if





you connect external devices to the computer when it is turned on, you risk damaging both the computer and the device.

You should also turn on external devices before you turn on the computer.

There are several ways to turn on the computer: manually, by pressing the power button on the front panel and remotely, using an optional network or modem or network card.

When the computer is turned on, the green power LED on the front panel lights and the computer runs a series of Power-On Self Tests (POST) to make sure everything is OK. After that the operating system is started.{xe "Power LED"}

### **Using the Network to Turn On the Computer{xe "Wake on LAN"}{xe "Network card"}{xe "LAN:Remote boot"}**

Your computer supports the Wake On LAN standard that allows a network administrator to start your computer remotely by sending a signal over the network to which your computer is connected. To use Wake on LAN:

- the installed network interface card must support Wake on LAN,
- the card must be connected to the Wake On LAN connector on the motherboard (see page 42 for more details),
- the *On LAN* item in the *Boot* menu of Setup must be set to *Power On* (see page 71).

If you ordered your computer with an Ethernet card installed, it is set up to support Wake on LAN.





### **Turning On the Computer Via the Modem{xe "Wake on Ring"}{xe "Modem"}{xe "Modem:Remote boot"}**

Your computer supports the Wake On Ring standard that allows it to wake up when an installed modem receives a phone call. To use Wake on Ring:

- the installed modem card must support Wake on Ring,
- the modem card must be connected to the Wake On Ring connector on the motherboard (see page 42 for more details),
- the *On Modem Ring* item in the *Boot* menu of Setup must be set to *Power On* (see page 71).

If you ordered the computer with the 56k v.90 modem card, this does not support Wake on Ring.





## ***Turning Off the Computer***{xe "Turning off the computer"}

There are several ways that you can shut down the computer:

- put the computer into power-saving Standby mode
- restart the computer
- shut down Windows
- turn off the computer manually.

These methods are described in the following sections.

### **Using Standby Mode**{xe "Suspend mode"}{xe "Power button"}{xe "Wake on LAN"}{xe "Wake on Ring"}{xe "Standby mode"}{xe "Shut down"}

When the computer returns from Standby mode, Windows and your programs should be exactly the same as they were when you entered the mode. Standby mode is part of the computer's power management, described in detail on page 24.

### **Restarting the Computer**{xe "Restarting the computer"}{xe "Resetting the computer"}

Restarting the computer reloads the operating system and you'll have to start the applications you want to use again.

To restart Windows, click the *Start* button in Windows, select *Shut Down...*, then select *Restart* and click *OK*. Windows closes down any open applications, then restarts the computer.

It is very important to always try to restart Windows this way, if you don't, you risk damaging the files in use at the time, and you may not be able to start Windows again. If you do restart the computer without using the Restart feature, the next time you turn it on, you'll see some warning messages and Windows will want to start a program called ScanDisk to make sure there's nothing wrong with the hard disk.

However, if Windows or a program you are using seems to have stopped responding, press the **Ctrl**, **Alt** and **Delete** keys at the same time. Windows opens the *Close Program* window (it may take a few minutes to appear). The window lists the active programs, and you should be able to close the problem program from here. After that you should be OK, but we recommend you go ahead and close everything else down normally, then restart the computer through the *Shut Down* utility on the *Start* menu.





If closing programs using the *Close Program* window still does not let you restart the computer, you can press **Ctrl-Alt-Del** two times to restart the computer.

Sometimes, the computer ignores any key presses, so to restart the computer, first wait until the hard disk LED on the front of the computer goes out, then press the Reset button to the right of the LED.

### **Shutting Down the Computer{x "Shutting down"}{xe "ScanDisk"}**

Shutting down Windows closes all applications that are open, and reminds you to save any unsaved files. The next time you turn on the computer, all of the components in and connected to the computer are reinitialized, then Windows starts from scratch and you'll have to start the applications you want to use and load the files you want to work on.

To shut down the computer, click the *Start* button in Windows, select *Shut Down...* and confirm that you want to shut down the computer. Windows closes down any open applications, then itself, and finally turns off the computer.

It is very important to always close Windows this way, if you don't, you risk damaging the files in use at the time, and you may not be able to start Windows again. If you do turn the computer off without shutting Windows down in this way, the next time you turn it on, you'll see some warning messages and Windows will want to start a program called ScanDisk to make sure there's nothing wrong with the hard disk.

However, if Windows or a program you are using seems to have stopped responding, press **Ctrl-Alt-Del**. Windows brings up the *Close Program* window (it may take a few minutes to appear). The window lists the active programs, and you should be able to close the problem program from here. After that you should be OK, but you should go ahead and close everything else down normally, then shut down the computer through the *Shut Down* utility on the *Start* menu.

If pressing **Ctrl-Alt-Del** has no effect, you'll have to turn off the computer manually.

### **Turning Off the Computer Manually**

If you're using an operating system that doesn't have a Shut Down feature like the one in Windows, you can turn the computer off manually. You can also turn off the computer manually with Windows running, but this is only recommended as a last resort, as you risk damaging files that the operating system needs to run correctly.

To turn the computer off manually, first wait until the hard disk LED on the front of the computer goes out, then press and hold the Power button on the front panel for about five seconds - until the computer shuts down - this is a safety feature to prevent the computer being accidentally turned off.





## **Power Management{xe "Power management"}{xe "Energy Star"}{xe "ACPI"}{xe "APM"}**

Power management in something as complex as a modern computer is also complex. This section gives an overview of the key features.

### ***ENERGY STAR, ACPI and APM***

First three important industry standards: ENERGY STAR®, ACPI and APM.



Computer equipment is the fastest-growing electric load in the business world. Unfortunately, much of the energy associated with computers is wasted because they are often kept on while not in use. We have followed the US government's Environmental Protection Agency's guidelines to ensure your computer meets the power usage guidelines in their ENERGY STAR® program. ENERGY STAR® computers:

- save you money in electricity bills
- may actually last longer than conventional products because they spend a large portion of time in a low-power Standby mode
- generate less heat than conventional systems
- tend to be quieter than conventional computers.

When you buy any electronic equipment - a printer, monitor, TV or VCR, check that it meets ENERGY STAR® power guidelines.





Your computer complies with the guidelines of the Advanced Configuration and Power Initiative (ACPI), which require that each component in or connected to your computer can be managed by the computer and Windows. This affects both the resources each component needs as well as how it uses power. The power management requirement is that the component stops using power when it isn't being used, but can be ready to work as soon as it's required. For example, the modem should not use power when it's not being used, but as soon as the phone rings, it should pick up the call.

Most of this happens without you doing anything, but it is important that when you use your computer with other devices, such as a modem or a printer, that these devices are also ACPI-compliant; check with the manufacturer or in the user guide.

The Advanced Power Management (APM) specifications are older, less comprehensive requirements for power management; your computer complies with APM 1.2.

The important thing to note about power management is that the components of your computer manage the power they use without needing you to do anything. There is no difference in performance between a computer that supports power management and one that doesn't, but the power-managed computer will be cooler and use less energy.

## ***Using Standby Mode***

In Standby mode, your computer reduces the power it used by putting all components into a low power state. If the monitor connected to your computer is compliant, it is sent a command that also reduces its power usage.

Power management in your computer can be controlled by the computer itself or by Windows. If you are using Windows 98, you should let the operating system manage the power, and not use the computer's power management features.

To access the power management controls within Windows, open *My Computer*, then open the *Control Panel*, then open *Power Management*. The Power Management Properties window that is displayed lets you set time-outs for System standby, the hard drive and the monitor. If the computer is inactive for the time set here, Windows puts the System into standby mode, or tells the hard drive or monitor to go into a low-power mode.

If you're using an operating system that does not have power management support, you can set up the computer to use similar time-outs, using Setup; see page 70 for more details.

In Windows, you can also enter Suspend mode by clicking the *Start* button, selecting *Shut Down* . . . then *Standby* and clicking *OK*.

You can also enter Suspend mode by {xe "Timeout"}pressing and immediately releasing the Power button on the front panel.

To wake the computer from Standby mode, you can:





- move the mouse or press any key on the keyboard
- press and immediately release the Power button on the front panel
- set the *On Modem Ring* item on the *Boot* menu in Setup to wake up the computer when a call is received on an installed modem card or a modem connected to one of the serial ports. You can use this to receive faxes or telephone messages when you are not at the computer. See page 71 for more details.
- set the *On LAN* item on the *Boot* menu in Setup to wake up the computer when a wakeup signal is received on an installed network card. See page 71 for more details.

## Using Audio{xe "Audio"}{xe "External speakers"}{xe "Microphone"}

Your computer has three audio jacks on the back panel (see page 13):

- Audio-In: connects to an external source of audio signals, such as a radio
- Audio-Out: connects to your external speakers
- Microphone-In: you can connect a microphone here.

You control the volume of audio from your computer in several ways: Windows has its own volume control - double-click on the speaker icon in the lower right corner to display it. You'll see that there is a master volume control as well as individual controls for each input device - the CD drive, microphone, etc. There may also be a volume control in the applications you're using - games usually have their own settings for audio volume. The external speakers also have their own volume control.

For the best signal and the least background noise, you need to maximize the volume in the application and in Windows, then use the external speaker volume control to set the sound level to an acceptable level.

## Using the Diskette Drive{xe "Diskette drive"}{xe "SuperDisk drive"}{xe "1.44MB diskettes"}{xe "120MB diskettes"}

The 3.5" diskette drive in your computer is either a standard diskette drive, supporting 720KB and 1.44MB diskettes or a SuperDisk (LS-120) drive that also supports 120MB diskettes.





When you start the operating system from diskette or the hard disk, the diskette drive is drive; if you start the operating system from the optical drive, the diskette drive becomes drive B.

To start (boot) the computer from a diskette, you first need to check the settings in the *Boot* menu in Setup; the *First Boot Device* should be set to *Removable* devices (see page 71 for details). If you make this change to Setup, but do not have a diskette in the drive when the computer is turned on, Windows starts normally from the hard disk.

### ***Standard Diskette Drive***

You can insert and remove diskettes at any time, whether the computer is on or off. To insert a diskette, slide it into the drive shutter end first with the label up until it clicks into place and the eject button sticks out. To remove a diskette, first check that the green light on the front of the drive is not lit, then push the eject button.

### ***SuperDisk Drive***

The computer must be on when you insert a diskette into the SuperDisk drive; slide it into the drive shutter end first with the label up until it clicks into place.

To remove a diskette, the best way is to use Windows as this ensures that any applications using the diskette are stopped first. Open *My Computer*, right-click on the drive icon, then select *Eject*. If the diskette is being used by a program, it will not be ejected until the program stops using it.

To remove a diskette manually, first check that the green light on the front of the drive is not lit, then push the eject button. If the diskette is being used by a program, it will not be ejected until the program stops using it.

If you need to remove a diskette from the SuperDisk drive but cannot turn on the computer, there is an emergency method. First wait for at least one minute after turning off the computer, then insert a stiff wire like a small, straightened paper clip into the small hole on the front of the drive above the eject button. The diskette should be ejected.

## **Using the Keyboard and Mouse{xe "Keyboard"}{xe "Mouse"}{xe "PS/2"}**

The keyboard and mouse supplied with your computer use the PS/2 ports on the back of the computer to connect to the system; see page 13 for the location of these ports.





Although the two PS/2 ports look identical, you cannot use them interchangeably. Also, you must not connect the keyboard or mouse when the computer is turned on – if you do you risk damaging both the computer and the keyboard or mouse.

Your mouse has a left and right button as well as a central wheel. You can control what each of these do using the *Mouse Properties* panel. In the lower right of your screen, next to the clock, you should see a small picture of a mouse. Double-click on this to open the *Mouse Properties* window, then go through each tab to see what features are available. Use the *Help* button at the bottom of the window for more information.

## Using the MIDI/Game Port{xe "MIDI port"}{xe "Game port"}{xe "Joystick"}{xe "USB"}

There are two ways to connect a joystick to your computer:

- via the USB port: USB joysticks can be connected and disconnected without turning off the computer and are automatically configured.
- via the game port on the back of the computer; see page 13 for the location of the port. If you use this port, the joystick must be connected before the computer is turned on.

The game port can also be used to connect to MIDI devices; after you install and start your MIDI program, the port will automatically switch to MIDI.

## Using a Modem{xe "Modem"}{xe "Phone line"}{xe "v.90 modem"}{xe "Fax"}{xe "Video:phone"}{xe "DSVD"}{xe "COM ports"}{xe "Serial ports"}

Your computer may have a modem option card installed; if so you'll see that there are two jacks for telephone lines in one of the slots on the back panel of your computer. One of the jacks (LINE) connects to the telephone line, the other (PHONE) can be connected to a telephone so that you can use the line to make calls when the computer is not using it. The modem supports the following:

- data reception using the v.90 standard – you can down-load data at up to 56kbps when connected to an Internet Service Provider (ISP) with compatible equipment. Current US FCC regulations limit data transfer rates to 53kbps due to excessive power demands at higher speeds.
- data modem connections up to 33.6kbps with error correction (v.42/ MNP 2-4) and data compression (v.42bis/ MNP5)
- video phone connections using the v.80 standard





- digital simultaneous voice and data (DSVD) connections over a single telephone line using the v.70 standard
- up to 14.4kbps fax transmission and reception.

With the modem installed, there are three serial devices in your computer: the two serial ports on the back panel and the optional modem. With Setup set to its default values, Windows refers to the two built-in ports as COM1 and COM2, and to the modem as COM3. You can change this by using Setup to change the addresses and interrupts used by the built-in ports (see page 66 for more details).

To use your modem with your communications program, you just need to tell the program that the modem is on COM3. Some older applications ask for a modem file; in this case, you should get a newer version of the application that uses the Windows settings.

## **Using a Network Card{xe "Network card"}{xe "LAN"}{xe "Ethernet card"}{xe "SMC Ethernet card"}{xe "Intel Pro/100+"}{xe "DMI"}{xe "LANDesk"}**

Your computer may contain one of two PCI Fast Ethernet network cards:

- the SMC 10/100BaseT network adapter
- the Intel PRO/100+ Management adapter.

If there is a network card installed, you'll see a single Ethernet 10BaseT (RJ-11) connector in one of the option slots on the back panel; connect the cable from your network here.

With the network card installed, your computer supports several key network management features:

- Desktop management interface (DMI) 2.0 and SMBIOS 2.1 support that allows inventory management over the network or via a modem
- Intel's LANDesk Client Manager (LDCM) which simplifies many of the tasks required for maintaining a PC, for example, reviewing system and configuration information about DMI/SMBIOS-compliant hardware components, backing up and restoring system files, troubleshooting system errors. Open the LDCM icon in Windows and use the built-in help there to find out more.





## Using the Optical Drive{xe "Optical drive"}{xe "CD-ROM drive"}{xe "DVD drive"}{xe "CDR-W drive"}{xe "Music CDs"}{xe "MPEG-2"}

Your computer contains one of three optical drives:

- a CD-ROM drive that you can use to access most compact disks
- a DVD-ROM drive that you can use to access most compact disks and DVD disks
- a CDR-W drive that you can use to access most kinds of compact disks, and record data on special kinds of compact disks.

A CD-ROM (Compact Disk, Read Only Memory) disk can store up to 74 minutes of music or 650MB of computer data and is read-only – you cannot change the data on the disk.

DVD-ROM disks can hold up to 18GB of data and are also read-only. Most DVD disks contain movies or instructional videos; the video and audio data on DVD disks is compressed using the MPEG-2 standard. In order to watch the movie, your computer needs some way to decode the MPEG-2 data; the MPEG-2 decoder in your computer can be in software (and use the processor to do all of the work) or in hardware (so the decoding is shared between the processor and a specialized MPEG-2 decoder).

There are two standards for recording (writing) data to CDs: CD-R and CDR-W. CD-R is a write-once technology – once the data is written to the disk, it cannot be changed or erased; this makes CD-R an excellent choice for making permanent records of data. Data can be written, erased and rewritten to CDR-W disks. The CDR-W drive in your computer supports both CD-R and CDR-W technologies.

CDR-W cannot be read by all standard CD-ROM drives and CD players. The recording material of a CDR-W disk isn't as reflective as a regular CD or a CD-R disk, so recorded CDR-W disks are only readable in CD-ROM drives with CDR-W or multi-read compatibility. While most new CD-ROM drives are compatible with CDR-W disks, many existing drives cannot read CDR-W disks. So, if you are making an audio CD, you should use CD-R disks that will play in your car or home stereo system, not CDR-W disks that probably won't. The CD-ROM, DVD-ROM and CDR-W drives available for your computer can all read CDR-W disks.

There are two standards of writing to CD-R and CDR-W disks: pre-mastering and Drive Letter Access (DLA). Pre-mastering software assembles all of the data, then writes all at one time (or session) to the disk. A multi-session disk has several of these sessions recorded on it.





DLA (or packet writing) software formats the disk much like a diskette or hard disk, so that files and folders can be dragged from any source to the drive letter of the disk. Files can even be saved directly from an application to this kind of disk, since it behaves just like a diskette or hard disk.

When your computer was set up in the factory, the optical drive is drive D.

To start (boot) the computer from a bootable CD in the optical drive, you need to change the *Boot Device* setting in Setup; see page 71 for more details. When you boot from a CD, it becomes drive A, and the diskette drive B.

To insert a CD or DVD disk, the computer needs to be turned on. Press the load/eject button on the front of the drive and the tray should open. Place the disk in the center of the tray, then press the load/eject button again to close the drive. You will hear the drive start, but wait about 10 seconds before trying to access the disk.

If you insert an audio CD, Windows will automatically detect it and start to play it. If you insert a data CD, depending on how the disk was created, Windows may automatically start the Setup program on the disk; if it doesn't, check with the application user guide for information on installing and using the disk.

To remove a disk, the best way is to use Windows as this ensures that any applications using the disk are stopped first. In the *Control Panel*, right-click on the drive icon, then select *Eject*. If the disk is being used by a program, the drawer will not open until the program stops using it.

To remove the disk manually first check that the light on the front of the drive is off, then press the load/eject button on the front of the drive. The disk stops spinning, then the drawer opens. If the disk is being used by a program, the drawer will not open until the program stops using it.





## **Using the Parallel Port{xe "Printer"}{xe "Scanner"}{xe "ECP"}{xe "EPP"}{xe "Bi-directional"}**

The most common use of the parallel port is to connect a printer or a scanner.

Before connecting or disconnecting a parallel port device, make sure the computer is turned off. If you try to connect the device with the computer, you risk damaging both the computer and the device.

There are four modes in which the parallel port can work: standard, bi-directional, extended capabilities port (ECP) and enhanced parallel port (EPP). Older printers use standard (unidirectional) mode, but newer ones support bi-directional and ECP modes. Parallel port scanners can work in bi-directional mode, but are faster in ECP or EPP mode. Most storage devices require bi-directional mode, but can also work in ECP or EPP modes for better performance.

Unfortunately, there are several different implementations of the EPP “standard” so if you cannot get a parallel device to work in EPP mode, check with the manufacturer to make sure you have the latest drivers.

The default setting of the parallel port is bi-directional, but you can change the mode through Setup; see page 66 for more details.

Some parallel devices have a pass-through connector, so that you can connect several parallel port devices in a “daisy chain”. If you are planning to do this, connect each device by itself, and make sure it is working correctly before linking them together.

## **Security{xe "Security"}{xe "Padlock"}{xe "Password"}**

There are several ways in which you secure your computer and the data on it:

- use the padlock loop on the back of your computer (see page 13) to prevent the system cover from being removed, and so restrict access to the drives and motherboard
- use the User and Supervisor passwords to restrict access to the operating system and Setup
- use a Windows password
- prevent data being written to the diskette drive.





## ***User and Supervisor Passwords{xe "Password"}{xe "User password"}{xe "Unattended start"}***

You can use Setup to set two passwords – User and Supervisor – that restrict access to Setup and the operating system. By setting separate passwords, a system supervisor can limit access to critical Setup values. The actual limitations depend on which passwords are set:

- If neither password is set, then the system starts without requesting a password and allows any user to have full access to all Setup values.
- If only the User password is set, the computer requests that password before it starts the operating system or Setup.
- If only the Supervisor password is set, the operating system is started without requesting a password, but the password must be entered to start Setup.
- If both passwords are set, the user can enter either password to start the operating system.

Once you set an Supervisor password, you can then limit the access a normal user has to Setup, for example, you might configure the system so that any user can enter Setup and view the current values but only the supervisor can change those values. See page 69 for more details on Setup.

There is also an Unattended Start setting in Setup that is active when a password is set. If this is disabled, the password must be entered before the operating system is started. If Unattended Start is enabled, the system starts the operating system, but the keyboard and mouse remain locked until the User password is entered. No prompt or dialog box will appear on the screen for the password, and any keystrokes typed will not be displayed. This feature is useful for network administrators who use the Wake On LAN feature for remote management applications – the computer can be started and maintenance provided over the network, but an unauthorized user would not be able to access the computer while this is happening. You set Unattended Start in Setup, see page 69 for more details.

The password can be up to eight characters long. It is case-sensitive, so make sure you note the **Caps Lock** setting before setting a password.





To set a password:

1. Turn on the computer and press **F2** to run Setup.
2. Go to the *Security* menu.
3. Move the cursor to *Set User* or *Supervisor Password* and press **Enter**.
4. Type the new password and press **Enter**.
5. Type the new password again and press **Enter**.

To change the password, follow the same steps, except you will need to enter the current password first. To delete a user password, use the *Clear User Password* option; to delete a Supervisor password, change the password, but don't enter a new password.

If you forget the password, follow the instructions on page 73 to access the Maintenance menu in Setup and clear the passwords.

### ***Windows Password***{xe "***Windows password***"}

As well as the passwords to restrict access to Setup and to the overall system, you can also set a password to access Windows. Note that this does not prevent access to the computer - anyone can skip the password and still access the data on the hard disk.

However the Windows password does allow you to set up Windows in different ways for different users. And once the password is entered, Windows can then remember any passwords for other programs you then set.

To set a Windows password, use the *Password* utility in the *Control Panel*. To stop Windows prompting you for a password, use the *Password* utility to change to a new password, but do not type a new one.

### ***Write-Protecting the Diskette Drive***{xe "***Diskette drive***"}{xe "***Write protection***"}

You can prevent data being copied to the diskette drive using the Setup program, see page 67 for more details.





## **Using the Serial Ports{xe "Serial ports"}{xe "COM ports"}{xe "Mouse"}{xe "External modem"}**

You can connect most serial devices such as mice and modems to the serial ports on the back panel. Serial devices must be connected and disconnected when the computer is turned off in order to work correctly. If you connect the device with the computer turned on, you may damage both the computer and the device.

Once the device is connected and turned on, you'll probably need to run a Setup program, refer to the device's manual for details.

However, the serial port standard is an old, slow one, and you should use the USB port instead – USB devices are faster, can be connected without turning off the computer and support plug and play so you don't have to reload drivers each time you connect or disconnect a device.

Windows refers to serial devices as COM1, COM2, COM3, etc, and assigns these according to the addresses and interrupts of the serial devices. There are two serial ports on the back of your computer (see page 13): COMA and COMB; the addresses and interrupts of these ports are set in Setup (see page 66). By default, COMA is set to COM1 and COMB to COM2.

## **Using the Tape Drive{xe "Tape drive"}**

If you bought your computer with the tape drive installed, it will be below the optical drive. The drive stores data and programs on tape; the capacity of the tape is 10GB standard, and up to 20GB with compression.

## **Using the USB Ports{xe "USB"}{xe "Universal Serial Bus" \t "See USB"}{xe "Hubs"}**

The Universal Serial Bus (USB) ports give you an easy way to connect accessories. Previously, you had to connect external devices in several different ways - parallel, serial, PS/2, game port - the computer and external device had to be turned off while doing this, and you spent a long time getting everything to work together. With USB, you can connect up to 127 devices to your computer, using cables between each device up to 16 feet (5m) long, each using the same type of connector. The first time you connect a device, you may have to load some software, but after that, the device is configured automatically.





## Using the Video Controller{xe "Video:controller"}{xe "VGA card"}{xe "ATi video card"}

Your computer contains one of two AGP video cards:

- the ATi XPERT 98 card featuring the ATI 3D RAGE PRO TURBO controller and 8MB of memory. If the DVD drive is installed, the card supports MPEG-2 decoding via software.
- the ATi XPERT 128 card featuring the ATi RAGE 128 GL processor and 16MB of memory. If the DVD drive is installed, the card supports DVD playback via a built-in hardware MPEG-2 decoder.

Each AGP video card comes with an application that lets you set up the display as you want it; click on the *ATi* icon next to the clock for more details.

## Using the Zip Drive{xe "Zip drive"}{xe "100MB cartridges"}

If you bought your computer with a Zip drive installed, it will be below the diskette drive in the front panel. A Zip drive allows you to store up to 100MB of data and programs on special Zip 100 cartridges, and then share the information with the millions of other computers with Zip drives installed.

The computer needs to be turned on to insert a Zip 100 cartridge. Insert the cartridge shutter end first with the label up until it clicks into place. After inserting the cartridge the light on the front of the drive flashes as the cartridge is initialized. After the initialization, you can access the cartridge.

The cartridge eject button on the front of the Zip drive houses a light and the emergency manual eject mechanism.

Light	Activity
ON Steady	Power on diagnostics
OFF	No cartridge inserted Cartridge inserted but not spinning Cartridge inserted and spinning, but media not being accessed
Fast Blink	Drive spinning up or down
Irregular Blink	Media being accessed Format in progress





	Format in progress
Slow Blink	Drive or cartridge malfunction

The best way to eject a cartridge is to use Windows, as this ensures that the cartridge is not being used before removing it. In *My Computer*, right-click on the *Zip 100* icon, then select *Eject*.

You can also use the eject button; first check that the light on the front of the drive is not on, then press the button. The cartridge spins down, then it is ejected. If the cartridge is being used, it will not be ejected.

When you shut down Windows, the cartridge is automatically ejected.

If you need to remove a cartridge but cannot turn on the computer, there is an emergency method. First wait for at least one minute after turning off the computer, then insert the a thin stiff wire, like a small, straightened paper clip, into the small hole to the left of the LED indicator on the cartridge eject button. The cartridge should be ejected.





## Changing Things

This section covers some of the ways you can change things inside your computer, including:

- adding more memory
- removing and replacing your drives
- installing an option card
- changing the processor
- replacing the RTC battery.

As well as the steps in this section, you should make sure you read any instructions that came with the thing you're going to install.

### ***Before You Begin***

Before you install any options or option cards, read and follow the following cautions.

- Before attempting to remove the cover, unplug the power cord from the wall socket and disconnect all cables attached to the computer from the keyboard, mouse, monitor, printer and so on.
- Even when the power switch is off, hazardous voltage and current levels are present inside the computer. Do not operate the computer with the cover removed - always replace the cover before turning on the system.
- Electrostatic discharge (ESD) can damage disk drives, option cards, or other system components. You should use an anti-static wrist strap attached to a ground when working inside the system. Place system components or option cards on a conductive foam pad to reduce the risk of electrostatic buildup.
- Disconnect the computer from any telecommunications links, networks, or modems before performing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems can result in personal injury or equipment damage. Some circuitry on the motherboard can continue to operate even though the front panel power button is off.

**WARNING:** Failure to disconnect power before removing the cover can result in personal injury and/or equipment damage!



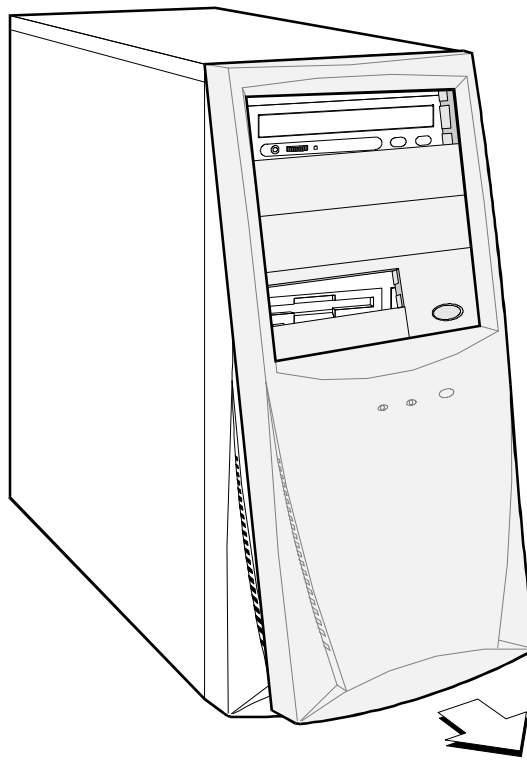


## ***Getting Inside the Computer{xe "Front panel"}{xe "Drive bays"}***

If you are going to install devices into the 3.5" or 5.25" drive bays, you need to first remove the front bezel; otherwise you only need to remove the system cover.

### **Removing the Front Bezel**

Grasp the plastic lip at the bottom of the front bezel, then pull out and then up until the front bezel is free.



### **Replacing the Front Bezel**

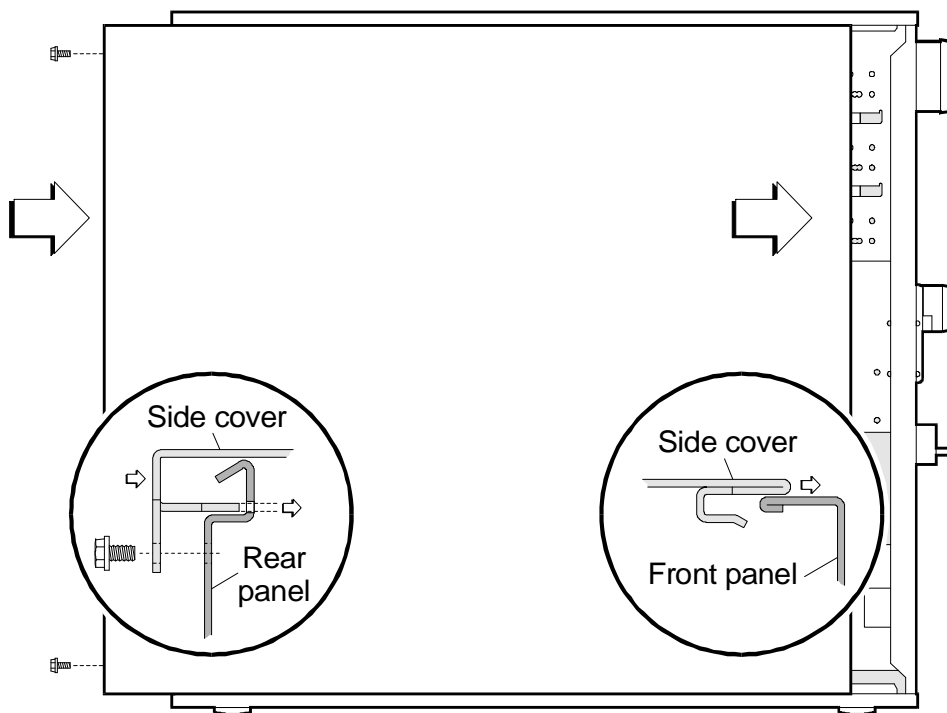
Align the plastic studs at the top of the bezel with the slots on the unit then press along the face of the front bezel until the studs snap into place.



## Removing the System Cover{xe "System cover"}{xe "Opening the computer"}

The system cover is on the left side of the computer when viewing it from the front.

1. Make sure you read the warnings on page 38.
2. Lay the unit on its right side and remove the padlock if one is being used to secure the cover.
3. Remove two retaining screws from the rear of the chassis.



4. Slide the cover toward the rear of the chassis until the front edge is free from the front panel and the rear tabs are free from the slots on the chassis.
5. Lift the cover straight up to remove it from the chassis.

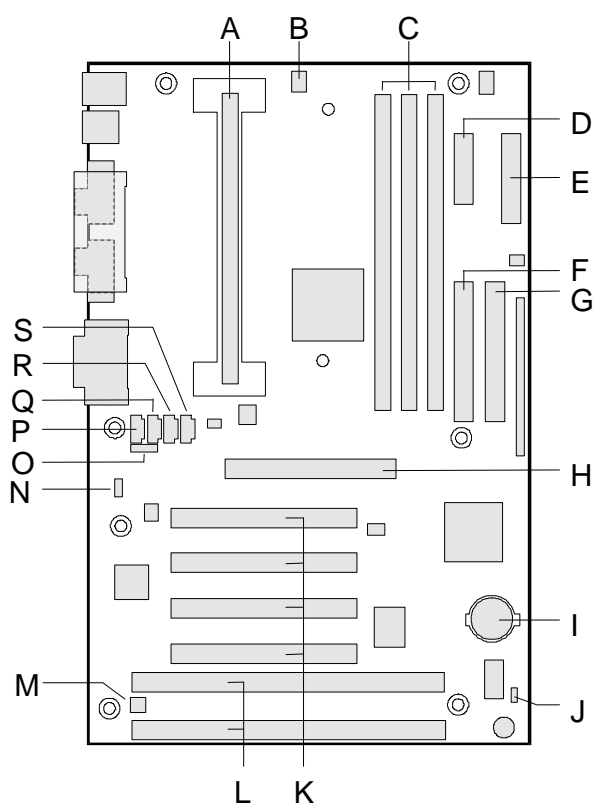


### **Replacing the System Cover**

1. Lay the unit on its right side and make sure that all internal cables, drives and option cards are properly installed and that screws are tightened.
2. Place the cover down over the chassis so that the front edge of the cover is about an inch from the front of the chassis.
3. Slide the cover forward until the flange on the front underside of the cover slides underneath the flange on the front of the chassis, and the rear tabs on the cover fit in the slots on the rear of the chassis.
4. Reinstall and tighten the retaining screws at the rear of the chassis.
5. If you are using one, replace the padlock.



**Motherboard Layout**  
**"Processor:socket"**  
**"Processor:fan"**  
**"Jumpers"**  
**"Password jumper"**  
**"BIOS:configuration jumper"**  
**"Fan connectors"**  
**"RTC battery"**  
**"Memory"**  
**"DIMMs"**  
**"IDE"**  
**"PCI cards"**  
**"AGP"**  
**"ISA cards"**  
**"CD-ROM drive"**  
**"Wake on LAN"**  
**"Wake on ring"**



A	Processor	H	AGP video card	O	CD-ROM audio
B	Processor fan	I	Real-time clock battery	P	CD-ROM line-in
C	DIMM sockets	J	BIOS Configuration jumper	Q	Telephony



D	Power	K	PCI cards	R	Aux line-in
E	Diskette drive	L	ISA cards	S	Video line-in
F	Secondary IDE	M	Wake On Ring		
G	Primary IDE	N	Wake On LAN		





## ***Adding Memory{xe "Memory"}{xe "Adding memory"}{xe "DIMMs"}{xe "SDRAM"}***

The memory in your computer is installed in three DIMM (dual in-line memory module) sockets, labeled DIMM 0, 1 and 2. Depending on how the memory was installed in your computer when you bought it, you may have one or two empty sockets for you to add more memory, or you may have to remove a module in order to increase the memory.

Each socket accepts 100MHz (or faster) unbuffered SDRAM modules with 32, 64, 128 or 256MB of memory. The DIMM modules must be gold-plated, with 144 pins and use 3.3V.

When installing memory modules, insert the modules in socket 0, then 1 and finally 2.

### **Removing a Memory Module**

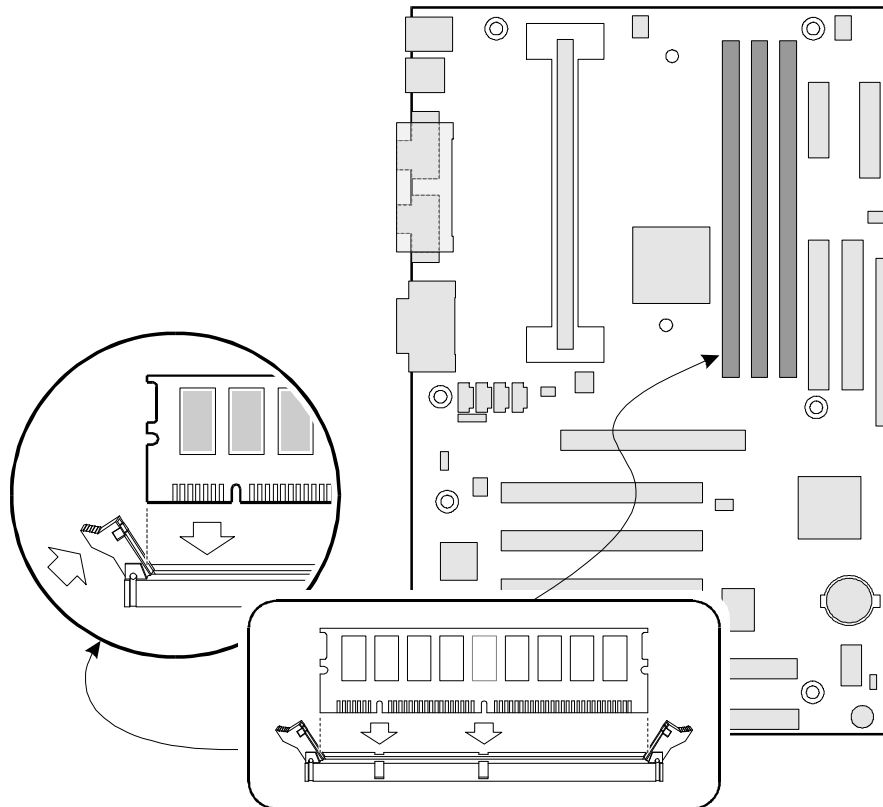
1. Follow the instructions on page 40 to remove the system cover.
2. If you unplug some of the cables that are attached to the motherboard and drives in order to get to the DIMM socket, label the cables so that you will be able to reinstall them later.
3. Gently spread the retaining clip at each end of the DIMM, then, holding the DIMM only by the edges, lift it away from the socket.
4. Store the DIMM in an anti-static package.
5. Follow the instructions on page 41 to replace the system cover.





## Installing a Memory Module

1. Follow the instructions on page 40 to remove the system cover.
2. Holding the new DIMM only by the edges, remove it from its anti-static package.
3. Ensure that the notches in the bottom edge of the DIMM align with the notches in the DIMM socket.
4. Insert the bottom edge of the DIMM into the DIMM socket, making sure that it is seated firmly. When the DIMM seats correctly, the retaining clips snap into place.



5. Reconnect any cables you had to unplug.
6. Follow the instructions on page 41 to replace the system cover.



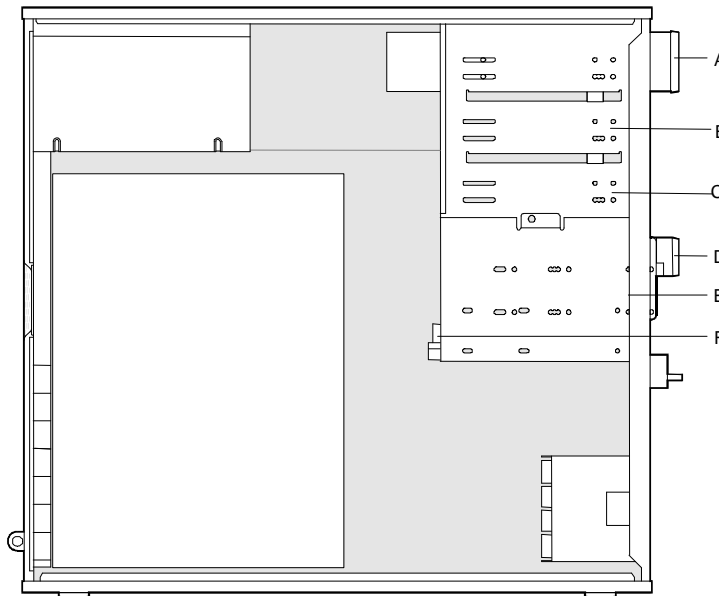
## **Changing Drives**

There are two sets of drive bays in your computer: a set of three 5.25" drive bays and a set of three 3.5" drive bays.

All three 5.25" drive bays can be accessed from outside of the computer via openings in the front bezel. The upper bay (labeled A in the following diagram) contains the optical drive (a CD-ROM, DCD or CDR-W drive); the middle bay (B) will contain a tape drive if you ordered one; the third bay (C) is available for you to install your own drive.

The upper two 3.5" drive bays can be accessed from outside of the computer via openings in the front bezel. The upper bay (labeled D) contains the diskette drive (either a standard 1.44MB or a 120MB SuperDisk drive); the middle bay (E) will contain a Zip drive if you ordered one; the lower bay (F) is not accessible from outside the computer and contains the hard disk.

You can change the installed drives or add additional drives in the empty bays. You can put an additional 3.5" drive in the empty 3.5" bay, or you can install it in one of the 5.25" bays if you mount the drive in a 5.25" drive carrier.





If you have a standard 1.44MB diskette drive in your computer, it connects to the motherboard via a special FDD cable. The other drives you may have in your computer (the hard drive, the optical drive, the SuperDisk, tape or Zip drives) connect via IDE data cables.

The motherboard in your computer has two IDE connectors, called primary and secondary; each connector has an IDE data cable connected to it. Each IDE cable can have two drives on it. For faster data transfer rates, it is better if you connect hard drives to the primary IDE cable, and the optical drive to the secondary one. Additional IDE drives can be connected to either of the remaining IDE connectors.

If you do connect two IDE devices to the same cable, you need to make sure that one device is configured as an IDE master and other as an IDE slave. In general, the hard disk that contains the operating system should be the master. Slave and master are usually set by jumpers on the drive, refer to the information that came with the drive for details.





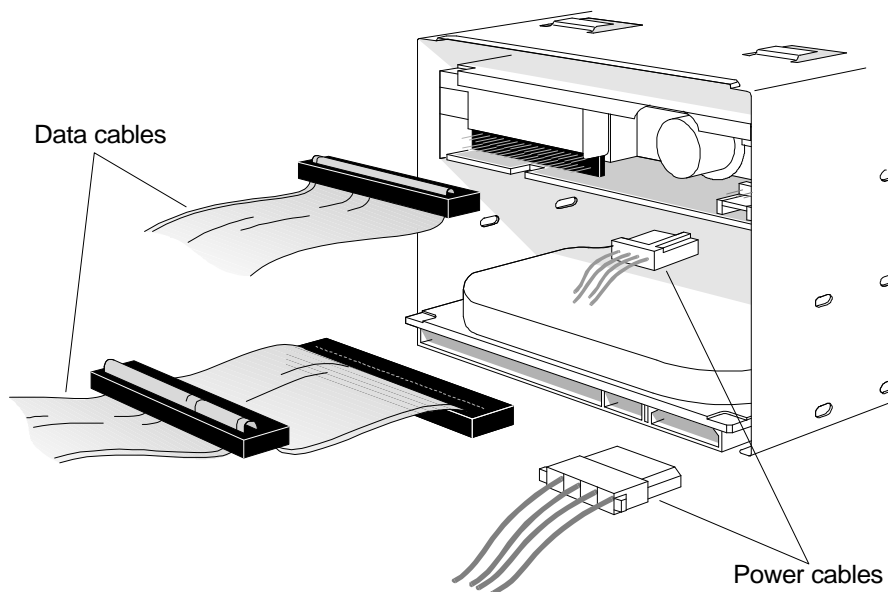
## **Changing Drives in the 3.5" Drive Bays{xe "Diskette drive"}{xe "3.5\" drives"}**

The illustrations with the following instructions show how to remove and install a diskette drive in the upper 3.5" bay, but you can also use them to install and remove drives in the other two bays.

**CAUTION:** While performing the following procedure, be careful not to scrape the drive cables or the mounting bracket against the motherboard and any cards that are attached to it.

### **Removing a 3.5" Drive**

1. Follow the instructions on page 40 to remove the system cover.
2. Disconnect the power and ribbon data cables from the drives in the 3.5" drive mounting bracket. If necessary, label the cables to assist you in reinstalling them later.

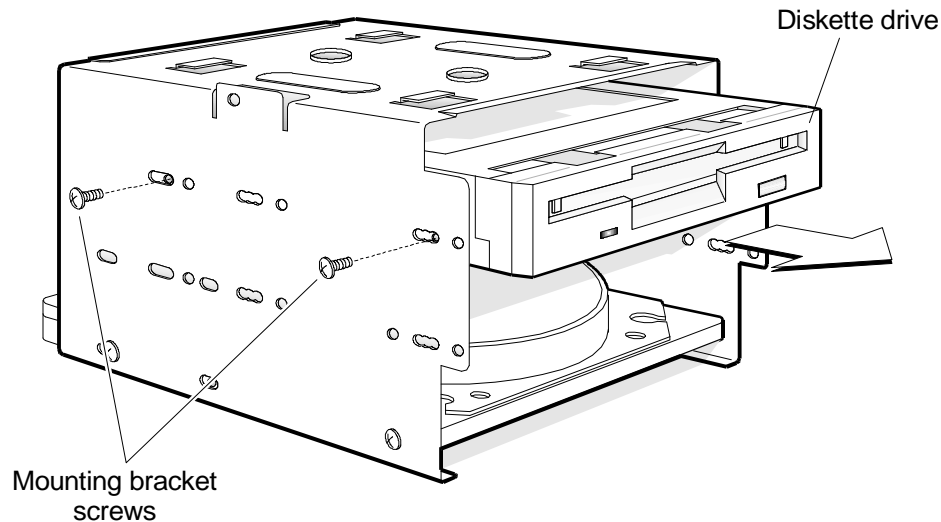


3. The 3.5" drive mounting bracket is secured inside the computer with a screw into the 5.25" drive mounting bracket. Remove and save this screw.





4. Slide the 3.5" drive mounting bracket toward the back of the unit until it disengages from the 5.25" drive mounting bracket. Remove the 3.5" drive mounting bracket and lay it on one side on an anti-static surface.
5. Remove and save two screws on each side of the bracket (total of four screws). Pull the drive out the front of the mounting bracket. If you're removing the hard disk, pull it out the rear of the bracket.



6. Store the drive in an anti-static protective wrapper.

### Installing a 3.5" Drive

1. Use the instructions in the previous section to remove the 3.5" drive mounting bracket from the computer.
2. Remove the drive from its protective wrapper and place it on an anti-static surface.
3. Set any drive jumpers or switches according to the manufacturer's instructions.
4. With the connectors on the drive to the rear, slide the drive into the 3.5" mounting bracket. Line up the holes on the bracket with the screw holes on the drive.
5. Insert and tighten two screws on each side of the drive.
6. If you are installing the drive into a bay that was empty, you may need to remove the EMI filler panel on the front panel of the cabinet and the plastic bezel insert on the front bezel in order to insert disks and tapes into the drive.





7. Align the top of the 3.5" drive mounting bracket with the bottom of the 5.25" drive mounting bracket.
8. Slide the 3.5" drive mounting bracket toward the front of the unit. The screw hole at the top of this bracket should line up with the screw hole on the 5.25" drive mounting bracket.
9. Insert and tighten the screw that attaches the 3.5" drive mounting bracket to the 5.25" drive mounting bracket.
10. Attach the power cables and the data cables to the diskette drive and the other drives in the 3.5" drive mounting bracket.
11. Follow the instructions on page 41 to replace the system cover.



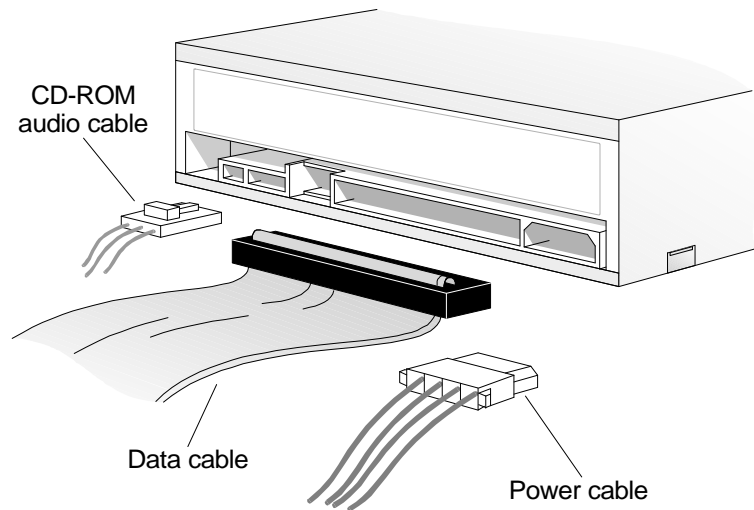


## ***Changing Drives in the 5.25" Drive Bays{xe "5.25\" drives"}***

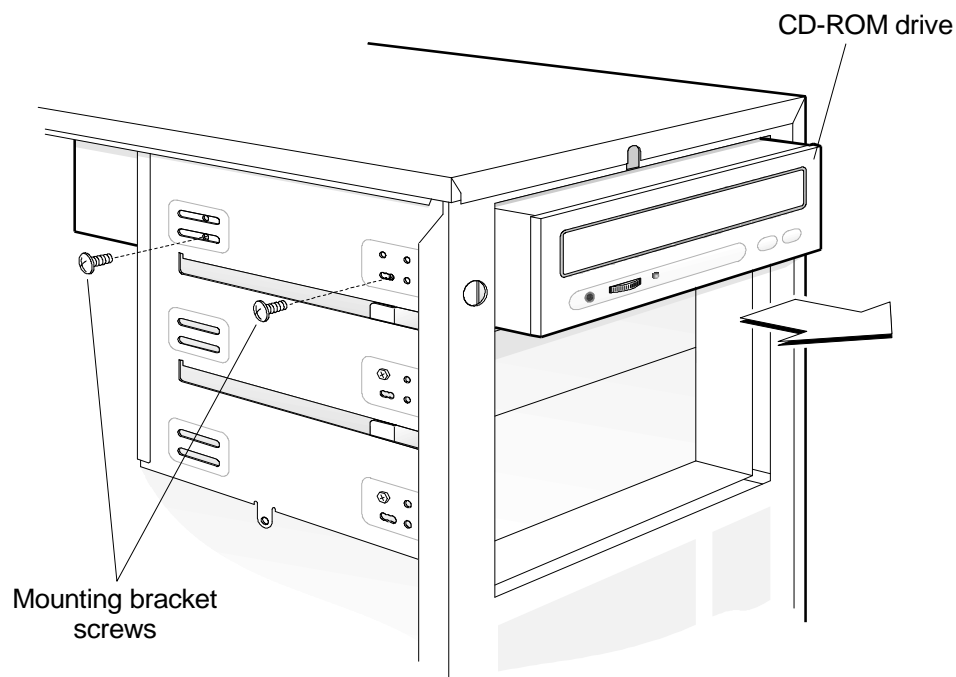
**CAUTION:** While performing the following procedure, be careful not to scrape the drive cables or the mounting bracket against the motherboard and any boards that are attached to it.

### **Removing a 5.25" Drive**

1. Follow the instructions on page 40 to remove the system cover.
2. Disconnect the power and data cables from the drive. If necessary, label the cables to assist you in reinstalling them later.



3. Remove and save two screws that secure the drive to the 5.25" drive mounting bracket.

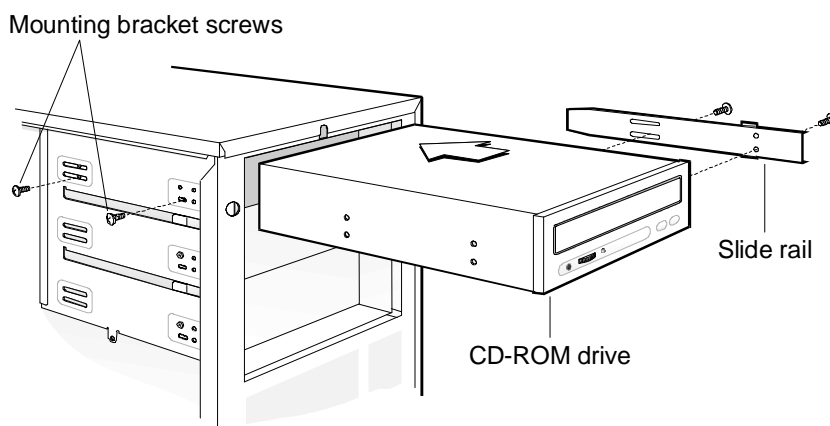


4. Slide the drive out through the front of the computer.
5. Remove and save the slide rail from the right side of the drive.
6. If the device is a 3.5" device mounted in a 5.25" carrier, remove the screws that hold the drive in place in the carrier. Slide the drive from the carrier.
7. Place the drive in an anti-static wrapper.
8. Follow the instructions on page 41 to replace the system cover.



## Installing a 5.25" Drive

1. Follow the instructions on page 40 to remove the system cover.
2. Remove the drive from its protective wrapper and place it on an anti-static surface.
3. Set any drive jumpers or switches according to the manufacturer's instructions.
4. If you are installing a 3.5" drive, mount it in a 5.25" drive carrier.
5. Install a slide rail on the right side of the device (or drive carrier, if the device is mounted in a drive carrier). If you are replacing a drive, use the slide rail from the drive you removed. If you are installing a drive in a bay that was previously unpopulated, use one of the slide rails included with your computer.
6. If you are installing the drive into a bay that was empty, you may need to remove the EMI filler on the front panel of the cabinet and the plastic bezel insert on the front bezel in order to insert tapes and disks into the drive.
7. Align the slide rail with the slots in the side of the bay, then slide the drive into place. The holes on the left side of the drive should line up with the screw holes on the mounting bracket.



8. Insert and tighten two screws on the left side of the mounting bracket to secure the drive.
9. Attach the power and data cables to the drives.
10. Follow the instructions on page 41 to replace the system cover.

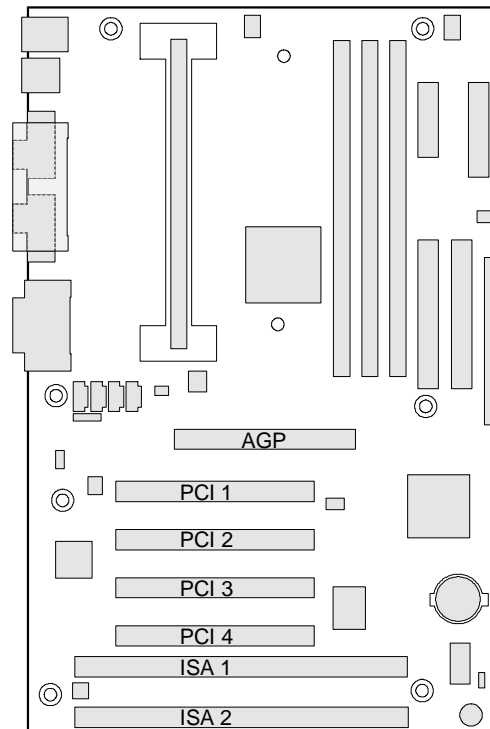




## **Changing Option Cards{xe "Option cards"}{xe "AGP"}{xe "PCI cards"}{xe "ISA cards"}**

The motherboard in your computer has connectors for three types of option cards:

- one AGP video card connector (labeled AGP below)
- four PCI card connectors (PCI1 through 4)
- two ISA card connectors (ISA1 and 2).



One of the PCI card connectors (PCI4) and one of the ISA card connectors (ISA1) share the same slot, so that you install either an ISA or a PCI card there.

If you ordered your computer with a network or modem card, it will be installed in one of the PCI connectors.





PCI cards are generally faster than ISA cards, and can be automatically configured by the computer. ISA cards usually require you to configure the card by setting jumpers and switches on the card itself. When you can, you should use PCI cards instead of ISA ones.

Your computer has a PCI configuration utility that automatically sets up a newly-installed PCI card to work with your computer and other PCI cards. However, if you install a new PCI card, it could conflict with the existing configuration so much that you cannot start the computer. If this happens, reset the configuration data using Setup as described below.

When you install ISA cards, you need to configure these in two ways: set jumpers or switches on the card before you install it, and use Setup to reserve resources such as interrupts and memory addresses. Refer to the ISA card manual for more details on what resources are used by the card, and refer to page 69 for more details on using Setup.

The system is designed to provide an average of 1.5A (amps) of +5 V power for each card in the system. The total +5 V current-draw in a fully loaded system (all option card slots filled) must not exceed 7.5A.

When a card is installed, you can access the external connectors on it via an opening in the back of the computer. When no card is installed in a slot, the opening is closed by a cover. If you remove or move a card, it is important that you use the covers to close the opening to ensure correct electromagnetic shielding and to ensure proper cooling.

### **Resetting PCI Configuration Data**

1. Remove the PCI card that is stopping the computer from starting.
2. Turn on the computer and enter Setup. Go to the *Advanced* menu and change the *Reset Configuration Data* setting to *Yes*. Save and exit Setup and let the computer restart.
3. Turn off the computer and install the PCI card.
4. Turn on the computer, the computer should now configure the PCI cards to work together.
5. Restart the computer and enter Setup. Go to the *Advanced* menu and change the *Reset Configuration Data* setting to *No*. Save and exit Setup.





## Removing an Option Card

Option cards can be extremely sensitive to ESD (Electrostatic Discharge) and always require careful handling. Hold the card by the edges only, and do not touch the electronic components or gold edge connectors. After removing a card from its protective wrapper or from the system, place it flat on a grounded, static-free surface, component-side up. Do not slide the card across any surface.

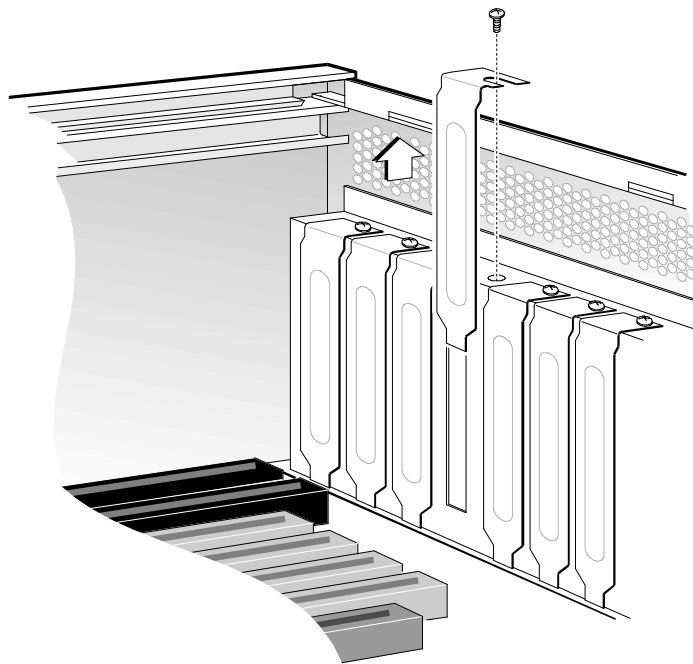
1. Follow the instructions on page 40 to remove the system cover.
2. Disconnect any cables attached to the option card to be removed.
3. Remove and save the screw that secures the card to the back of the computer.
4. Hold the card at each end and gently rock it back and forth until the edge connectors pull free. Be careful not to scrape the card against other components.
5. Store the card in an anti-static protective wrapper.
6. Install an expansion slot cover over the vacant opening in the back panel.
7. Reinstall the screw to secure the slot cover.
8. Follow the instructions on page 41 to replace the system cover.





## Installing an Option Card

1. Follow the instructions on page 40 to remove the system cover.
2. Remove the screw from the top of the slot cover of the slot where you will install the card.
3. Slide the slot cover away from the card rack and lift it out. Save the slot cover in case you need to remove the card.

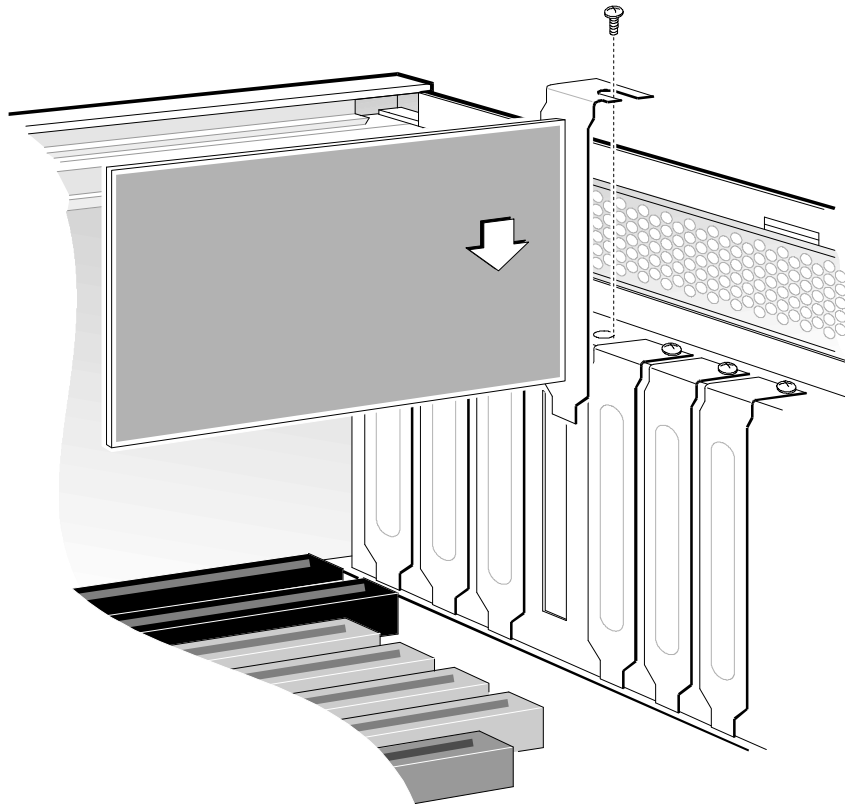


4. Remove the option card from its wrapper and place it on a grounded, static-free surface, component-side up.
5. Set any card jumpers or switches according to the manufacturer's instructions.





6. Holding the card by its top edge or upper corners, firmly press it into the connector on the motherboard.



7. Ensure that the card's connectors line up through the open slot at the back of the cabinet.
8. Reinstall the screw from the slot cover to secure the card in the slot.
9. Connect cables (if needed) to the installed card.
10. Follow the instructions on page 41 to replace the system cover.





## **Changing the Processor{xe "Processor"}{xe "CPU"}**

The Intel® processor in your computer is installed into a 242-contact slot connector on the motherboard. Processor modules are available in three packages:

- the Single Edge Processor (S.E.P.) package
- the Single Edge Contact Cartridge (S.E.C.C.)
- the Single Edge Contact Cartridge 2 (S.E.C.C.2).

Each module includes processor and the cache memories, and connects to the rest of your computer via a 100MHz system bus.

If you are installing a processor of a different speed from the one currently installed, you need to set the processor speed using the *Maintenance* menu of the Setup program; see page 73 for details.

### **Removing the Processor**

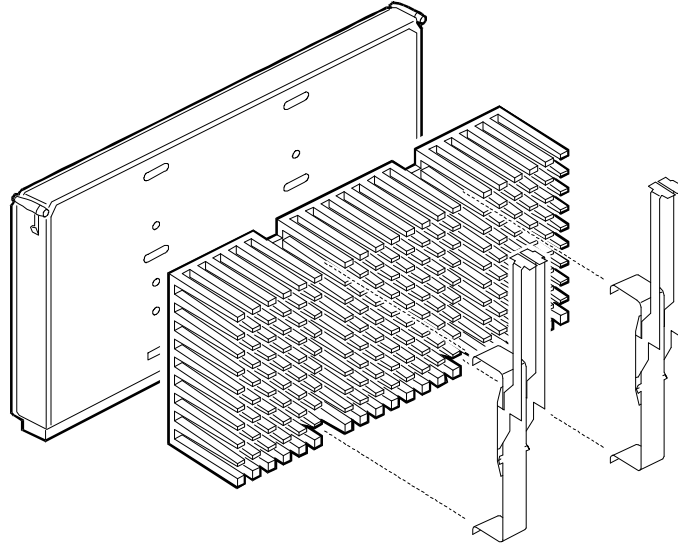
**WARNING:** The processor module and heatsink will be hot if the computer has been running. To avoid personal injury, wait at least 10 minutes for the module and heatsink to cool after turning off the computer.

1. Follow the instructions on page 40 to remove the system cover.
2. Squeeze the locking tabs on the top of the processor and lift the processor and attached heatsink from the socket.





3. Remove the heatsink clips by sliding them straight out, then up and away from the processor. Separate the heatsink from the processor



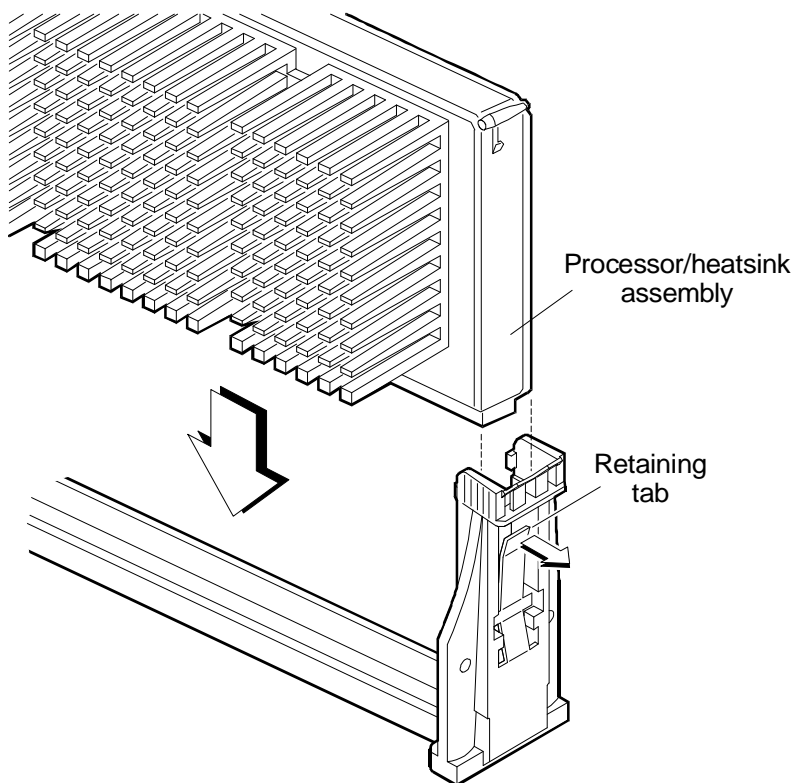
4. Place the processor in an anti-static package.





## Installing a Processor

1. Remove the processor from its anti-static package; do not touch the edge connector.
2. Install the heatsink on the processor and fasten with the heatsink attach clips.
3. Insert the processor and heatsink into the motherboard socket. Be sure the retaining tabs actuate.



4. If you installing a processor of a different speed from the one that was installed, follow the instruction on page 73 to access the *Maintenance* menu and set the correct speed.
5. Follow the instructions on page 41 to replace the system cover





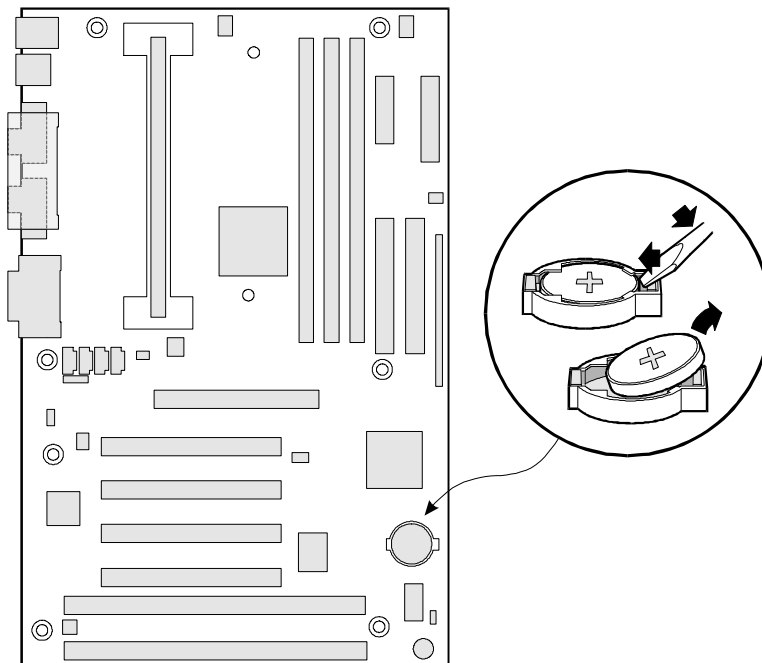
## **Replacing the RTC Battery**

Your computer contains a Real-Time Clock (RTC) that keeps the system time and date accurate to within 13 minutes each year. The RTC also contains memory used by Setup to store its values. The RTC is supported by a coin-cell lithium-ion battery that has an estimated lifetime of five years. When the battery reaches the end of its life, the settings in the RTC memory may be lost and the date and time may become incorrect.

Replacing a battery with an incorrect type can cause an explosion: the replacement battery must be a Sony CR2032 battery or equivalent; this is a 3V Lithium-Ion coin cell battery.

**WARNING:** Do not expose batteries to excessive heat or fire. Keep all batteries away from children. Always discard used batteries according to their manufacturer's instructions.

1. Follow the instructions on page 40 to remove the system cover.
2. Use a small, flat-bladed screwdriver to press the retaining clip on the battery holder and disengage the battery.





3. Remove the battery from its socket, taking care to note the orientation of the “+” and “-” signs on it .
4. Position the new battery in the socket so that its “+” and “-” signs are in the same orientation as the previous battery’s.
5. Press the new battery securely into the socket.
6. Follow the instructions on page 41 to replace the system cover



## The Setup Program{xe "Setup"}{xe "Language"}{xe "L2 cache memory"}{xe "Date"}{xe "Time"}

Your computer has a built-in Setup program you use to change the way the computer uses its components. To start Setup, turn on the computer, then press **F2** when the following message appears on screen:

**Press <F2> key if you want to run SETUP**

You only have a few seconds to do this before the computer starts to load the operating system.

The Setup Main screen displays the computer's basic configuration; other functions are listed in the six menus across the top of the screen. A seventh menu, Maintenance, only appears when the BIOS Configuration jumper is set on the motherboard. The items in the menus are described in the following pages. The keys you can use are shown on the lower part of the screen.

When changing the settings in Setup, you may assign the same resources to two different devices, which usually prevents both devices from working. If a setting will cause problems, Setup marks the conflict with a \*.

### ***The Main Menu***

Most of the items on the Main menu are information on the components installed in the computer and cannot be altered.

Language	English (US)† Français Italiano Deutsch Español	Selects the language used by Setup.
L2 Cache ECC Support	Enabled Disabled†	The L2 cache in the processor module does not support ECC memory, so do not change this.
System Time	hours, minutes, seconds	Sets the system time in the 24-hour format.
System Date	month, day, and year	Sets the system date



† - default setting

***The Advanced Menu{xe "Plug and Play O/S"}{xe "Operating system"}{xe "PCI configuration"}{xe "NumLock"}{xe "Advanced menu"}***

Several of the items on this menu lead to sub-menus that are described in following tables.

Plug and Play O/S	No† Yes	Specifies whether a Plug and Play operating system is being used; if you are using Windows 98, set this to Yes, if you are using Windows NT, set this to No.
Reset Configuration Data	No† Yes	If you install a PCI option card, and the system will not start correctly, set this to Yes to reset the card configuration data to its factory default settings.
NumLock	Auto† On Off	Determines the status of the NumLock key when the computer is started. Auto turns on NumLock for keyboards with 101 or more keys, off for other keyboards.

† - default setting



**Peripheral Configuration Submenu**{xe "Serial ports"}{xe "COM ports"}{xe "COM2"}{xe "I/O address"}{xe "Interrupts"}{xe "Parallel port"}{xe "Printer port" \t " See Parallel port"}{xe "USB"}{xe "Bi-directional"}{xe "ECP"}{xe "EPP"}{xe "Audio"}

Serial Port A	Disabled Enabled Auto†	Configures serial port A on the back panel. <i>Auto</i> assigns the first free resources, usually 3F8 and IRQ 4, making the port COM1.
Base I/O Address	3F8† 2F8, 3E8, 2E8	Sets the I/O address for serial port A.
Interrupt	IRQ 3, IRQ 4†	Sets the interrupt for serial port A.
Serial Port B	Disabled Enabled Auto†	Configures serial port B on the back panel. <i>Auto</i> assigns the next free resources, usually 2F8 and IRQ 3, making the port COM2.
Mode	Normal† IrDA, ASK-IR	Leave this set to Normal.
Base I/O Address	3F8, 2F8† 3E8, 2E8	Sets the I/O address for serial port B.
Interrupt	IRQ 3† IRQ 4	Sets the interrupt for serial port B.
Parallel Port	Disabled Enabled Auto†	Configures the parallel port. Auto assigns address 378 and interrupt IRQ 7, making it LPT1.
Mode	Output Only Bi-directional† EPP, ECP	Selects the mode for the parallel port.
Base I/O address	378†, 278, 228	Sets the I/O address for the parallel port.
Interrupt	IRQ 5, IRQ 7†	Sets the interrupt for the parallel port.
Audio	Disabled Enabled†	Enables or disables the built-in audio controller.
Legacy USB Support	Disabled† Enabled	If you are using a USB keyboard or mouse, enabling this allows you to use it in Setup.

† - default setting



### IDE Configuration Submenu{xe "IDE"}{xe "Hard disk drive"}

Most IDE devices are automatically detected and configured by the computer, so you can usually leave *Type* set to *Auto*. If you have installed an IDE device that is not automatically configured by Setup, refer to the device's user guide for the correct entries here. The default settings for each item depend on the installed device.

IDE controller	Disabled Primary, Secondary, Both†	Lets you enable or disable the two IDE buses from the built-in IDE controller.
Hard Disk Pre-Delay	Disabled† 3, 6, 9, 12, 15, 21, 30 seconds	If you install a hard disk that needs time to become active after turning on the computer, set this here.
Type	None, ATAPI Removable CD-ROM, IDE Removable, Other ATAPI, User, Auto†	Sets the type of IDE device.  Select <i>User</i> to enter the cylinders, heads and sectors directly.  <i>Auto</i> automatically fills in the values
Multi-Sector Transfers	Disabled, 2, 4, 8, 16 sectors	Sets the number of sectors per block for multiple sector transfers from the device.
LBA Mode Control	Disabled Enabled	Enables Logical Block Addressing instead of the actual cylinders, heads and sectors.
Transfer Mode	Standard, Fast PIO 1, 2, 3, 4, FPIO 3 / DMA 1, FPIO 4 / DMA 2	Select the method for moving data to or from the drive.
Ultra DMA	Disabled, Mode 0, 1, 2	Sets the Ultra DMA mode for the device.

† - default setting



### Floppy Options Submenu{xe "Diskette drive"}{xe "Security"}{xe "Write protection"}

Floppy Disk Controller	Auto, Disabled, Enabled†	Enables or disables the built-in diskette drive controller.
Diskette A:	Disabled 360 KB, 5.25 inch 1.2 MB, 5.25 inch 720 KB, 3.5 inch 1.44/1.25 MB, 3.5 inch† 2.88 MB, 3.5 inch	Specifies the physical size and capacity of the diskette drive.
Floppy Write Protect	Disabled† Enabled	A security feature: when enabled, prevents data being copied to a diskette.

† - default setting

### DMI Event Logging Submenu{xe "DMI"}{xe "ECC"}

Clear all DMI event logs	No† Yes	Clears the event log when the computer is restarted.
Event Logging	Disabled, Enabled†	Enables logging of DMI/SMBIOS events.
ECC Event Logging	Disabled, Enabled†	Enables logging of ECC events.

† - default setting

### Video Configuration Submenu{xe "Video"}{xe "AGP"}

Palette Snooping	Disabled† Enabled	If you install an ISA video card, you may need to enable this.
AGP Aperture Size	64 MB† 256 MB	If you install an AGP video card that can use more 64MB of system memory, you can change this here.
Default Primary Video Adapter	PCI, AGP†	If you install a PCI video card, select PCI to set the card as the primary display device.

† - default setting



### **Resource Configuration Submenu{xe "Memory"}{xe "Interrupts"}{xe "IRQ"}{xe "ISA CARDS"}**

This submenu is used to reserve blocks of memory and specific interrupts for use by legacy (non-Plug and Play) ISA devices.

Memory Reservation C800 – CBFF CC00 – CFFF D000 – D3FF D400 – D7FF D800 – DBFF DC00 – DFFF	Available † Reserved	Reserves specific memory blocks for use by legacy ISA devices.
IRQ Reservation IRQ 3, IRQ 4, IRQ 5, IRQ 7, IRQ10, IRQ11, IRQ12	Available † Reserved	Reserves specific IRQs for use by legacy ISA option cards.

† - default setting

### **The Security Menu{xe "Security"}{xe "Passwords"}{xe "User password"}{xe "Administrator password"}**

Refer to page 32 for more details about how passwords are set and used.

Clear User Password		Only appears if a password has been set. Clears the user password.
User Setup Access	None View only Limited access Full†	Only displayed when a Supervisor password is set. Sets restrictions on how what a User can do in Setup.
Unattended Start	Disabled † Enabled	When enabled, the computer starts, but the keyboard is locked until the password is entered.

† - default setting





***The Power Menu{xe "Power management"}{xe "Hard drive timeout"}{xe "Monitor timeout"}{xe "System timeout"}***

Power Management	Disabled, Enabled†	Enables or disables the computer's power management features for all operating systems.
Inactivity Timer	Off† 1, 5, 10, 20, 30, 60, 120 minutes	Specifies the amount of time before the computer enters Standby mode; you only need to set a value here if you are using an operating system that does not have its own power management.
Hard Drive	Disabled, Enabled†	Specifies if the hard disk uses less power when the computer is in Standby mode.
VESA Video Power Down	Disabled, Standby† Sleep	Sets the mode for the monitor when the computer is in Standby mode.

† - default setting



## **The Boot Menu{xe "Booting"}{xe "POD"}{xe "Diagnostics"}{xe "Power failure"}{xe "Modem"}{xe "Wake on ring"}{xe "Wake on LAN"}{xe "Wake on PME"}**

The *Hard Drive* and *Removable Devices* submenus let you specify the boot sequence for installed devices. This can affect which operating system is loaded, and the drive letter assigned to each device.

Boot-time Diagnostic Screen	Disabled† Enabled	When enabled, the computer displays diagnostics messages each time it starts.
Quick Boot Mode	Disabled Enabled†	When enabled, the computer skips some diagnostics tests when it starts.
Scan User Flash Area	Disabled† Enabled	When enabled, the computer uses binary files when the computer starts.
After Power Failure	Stay Off, Last State† Power On	Specifies what happens if the AC power returns after failing:  <i>Power On</i> turns the computer on  <i>Stay Off</i> keeps the power off until the power button is pressed.  <i>Last State</i> restores the power state when the power failed.
On Modem Ring	Stay Off Power On†	Sets how the computer responds to a call to the modem when it is off.
On LAN	Stay Off Power On†	Sets how the computer responds to a network wakeup event when it is off.
On PME	Stay Off† Power On	Sets how the computer responds to a power management wakeup event.
First Boot Device Second Boot Device Third Boot Device Fourth Boot Device	Removable Hard Drive ATAPI CD Network Boot	Specifies the boot sequence from the available devices. The operating system assigns a drive letter to each boot device in the order listed. Changing the order of the devices may change the drive lettering.



† - default setting

### ***The Exit Menu{xe "Exit menu"}{xe "Setup:loading defaults"}***

Exit Saving Changes	Exits and saves any changes you've made.
Exit Discarding Changes	Exits without saving any changes you've made.
Load Setup Defaults	Loads the factory default values for all the Setup options.
Load Custom Defaults	Loads the custom defaults for the Setup options.
Save Custom Defaults	Saves the current values as custom defaults. Normally, Setup gets its values from its own memory. If this memory is corrupted, Setup uses the custom defaults. If no custom defaults are set, Setup uses the factory defaults.
Discard Changes	Discards any changes you've made without exiting Setup.

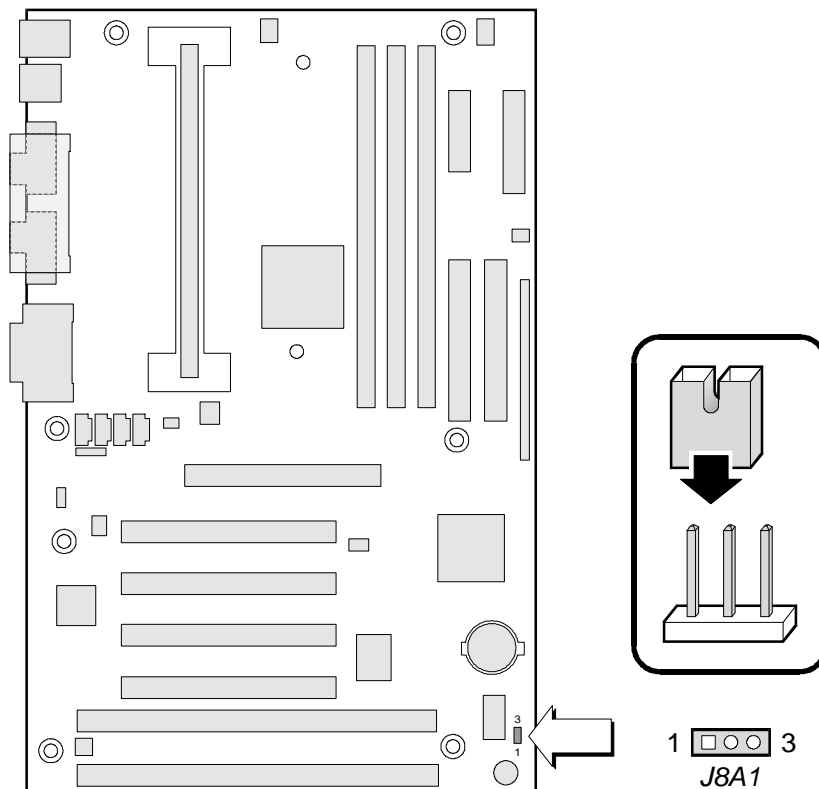




## ***The Maintenance Menu{xe "Maintenance menu"}{xe "Password:clearing"}{ XE "Processor:speed" }{xe "CPU:speed"}***

You can use the Maintenance menu to specify the processor speed and clear the passwords. The menu is only displayed when the BIOS Configuration jumper is set on the motherboard. To set the jumper:

1. Remove the system cover as described on page 40.
2. Move the jumper so that it connects pins 2 and 3.



3. Replace the system cover as described on page 41.
4. Turn on the computer and press **F2** to run Setup then access the *Maintenance* menu.





5. After you have finished using the menu, use the above steps to move the jumper back to connect pins 1 and 2.

## **Troubleshooting and Error Codes{x<sub>e</sub> "Troubleshooting"}{x<sub>e</sub> "Error codes"}{x<sub>e</sub> "Beep codes"}**

When you turn on your computer, before starting the operating system, it goes through series of power-on self-tests. If any problems are found, the computer displays an error message telling you about them. These messages are explained in the following table.

In some cases, the computer will also let you know what the problem is by making a series of beeps; these beep codes are explained in the table starting on page 76. If no problems are found, the computer makes a single beep before starting to load the operating system.

### ***Start-Up Error Messages{x<sub>e</sub> "Error messages"}{x<sub>e</sub> "BIOS:error messages"}***

<b>Error Message</b>	<b>Explanation</b>
Diskette drive A error	Check the drive is installed correctly (page 46) and is listed correctly in Setup (page 67).
Extended RAM Failed at offset: <i>nnnn</i> Failing Bits: <i>nnnn</i>	The memory is not working properly. Make sure the memory is the correct type and that it is installed correctly (page 44).
Fixed Disk <i>n</i> Failure Fixed Disk Controller Failure	The hard disk is not working or is not configured properly. Make sure the drive is installed properly (page 46) and that it is correctly identified in Setup (page 67).
Incorrect Drive A type - run SETUP	The type of diskette drive for drive A is not correctly identified in Setup (page 64).
Invalid NVRAM media type	Problem with NVRAM (CMOS) access.
Keyboard controller error	The keyboard controller failed its test; turn the computer off and reconnect the keyboard.





Error Message	Explanation
Keyboard error	The keyboard is not working; turn the computer off and reconnect the keyboard.
Keyboard error <i>nn</i>	The key with scan code <i>nn</i> is stuck; check to see if anything is resting on the keyboard and that the keys look OK.
Operating system not found	Check that the diskette, hard disk and optical drives are correctly installed and identified in Setup.
Parity Check 1	Parity error found in the system bus. The computer attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.
Parity Check 2	Parity error found in the I/O bus. The computer attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.
Press <F1> to resume, <F2> for Setup	Displayed after any recoverable error message. Press <b>F1</b> to continue to start the computer or <b>F2</b> to enter Setup.
Real time clock error	Real-time clock failed. You may need to replace the battery and run Setup to reconfigure the system.
Shadow RAM Failed at offset: <i>nnnn</i>	The memory is not working properly. Make sure the memory is the correct type and that it is installed correctly (page 44).
System battery is dead - Replace and run SETUP	The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.
System cache error - Cache disabled	The processor cache failed and was disabled. You may need to replace the processor module.
System CMOS checksum bad - run SETUP	System CMOS RAM has been corrupted or modified incorrectly, perhaps by an application. Run Setup and reconfigure the system either by getting the default values and/or making your own selections (page 64).
System RAM Failed at offset: <i>nnnn</i>	The memory is not working properly. Make sure the memory is the correct type and that it is installed correctly (page 45).



### ***Start-Up Beep Codes{xe "Beep codes"}***

If an error occurs when you turn on the computer, you may hear a series of beeps; the computer also sends an error code to the parallel (Port 80h) port.

<b>Beeps</b>	<b>Port 80h Code</b>	<b>Explanation</b>
1-2-2-3	16h	BIOS ROM checksum
1-3-1-1	20h	Test DRAM refresh
1-3-1-3	22h	Test keyboard controller
1-3-3-1	28h	Autosize DRAM
1-3-3-2	29h	Initialize POST memory manager
1-3-3-3	2Ah	Clear 512 KB base RAM
1-3-4-1	2Ch	RAM failure on address line xxxx
1-3-4-3	2Eh	RAM failure on data bits xxxx of low byte of memory bus
1-4-1-1	30h	RAM failure on data bits xxxx of high byte of memory bus
2-1-2-2	45h	POST device initialization
2-1-2-3	46h	Check ROM copyright notice
2-2-3-1	58h	Test for unexpected interrupts
2-2-4-1	5Ch	Test RAM between 512 and 640 KB
1-2	98h	Search for option ROMs. One long, two short beeps on checksum failure.



## Modem AT Commands{x "Modem commands"}{xe "AT commands"}

All AT commands must begin with AT and end with you pressing **Enter**. The commands can be in either lower- or upper-case but not mixed.

### Basic AT Commands

A/	Re-execute command	I2	Compute and compare checksum
A	Answer a call	L0	Sets lowest speaker volume
B0	Select v.22 (CCITT) mode at 1200bps	L1	Sets low speaker volume†
B1	Select Bell 212A mode at 1200bps	L2	Sets medium speaker volume
Dn	Dial <i>n</i> when <i>n</i> is 0 – 9, # or *	L3	Sets high speaker volume
DL	Last number redial	M0	Turns speaker off
DP	Pulse dialing	M1	Turns speaker on during handshaking, off afterwards†
DT	Touch tone dialing†	M2	Turns speaker on during handshaking and receiving carrier, off afterwards
DW	Wait for a second dial tone	M3	Turn speaker off during handshaking and receiving carrier, on afterwards
D,	pause	N0	Turn automode detection off
D@	Wait for 5 seconds of silence	N1	Turn automode detection on†
D!	flash	O0	Go on-line
D;	Return to Command Mode after dialing	O1	Go on-line and initiate training
D\$	Bong tone detection (for credit card calls)	P	Force pulse dialing
DS= <i>n</i>	Dial one of four stored telephone numbers ( <i>n</i> = 0 – 3)	Q0	Modem sends responses†
E0	Turn off command echo	Q1	Modem does not send responses
E1	Turn on command echo†	Sr?	Display the value of register <i>n</i>
H0	Hang up	Sr= <i>n</i>	Set the value of register <i>r</i> to <i>n</i>
H1	Enter command mode	T	Force tone dialing†
I0 or I3	Report firmware revision, model and interface type	V0	Numeric responses





I1	Compute and report checksum	V1	Word responses†
W0	Report DTE speed)	X2	Report basic call progress result codes and connection rates(OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx, No DIAL TONE and ERROR)
W1	Report line speed, EC protocol and DTE speed	X3	Report basic call progress result codes and connection rates(OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx, BUSY and ERROR)
W2	Report DTE speed in EC mode	X4	Report all call progress result codes (OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx, BUSY, No DIAL TONE and ERROR)†
X0	Report basic call progress result codes (OK, CONNECT, RING, NO CARRIER, NO ANSWER and ERROR)	Y0	Modem does not send or respond to break signals.
X1	Report basic call progress result codes and connection rate (OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx and ERROR)	Z0	Restore stored profile 0 after warm reset

† - default setting





### ***Extended AT Commands***

&C0	Force Carrier Detect signal high†	&K4	Enable XON/XOFF DTE/DCE flow control
&C1	Turn on CD when remote carrier is present	&M0	Select direct asynchronous mode
&D0	Ignore the DTR signal†	&S0	DSR is always active†
&D1	Return to Command Mode after DTR toggle	&S1	DSR off in Command Mode, on in on-line mode
&D2	Hang up and return to Command Mode after DTR toggle	&T0	Terminate any test in progress
&D3	Reset modem after DTR toggle	&T1	Initiate local analog loopback test
&Fn	Restore factory configuration <i>n</i>	&T3	Initiate local digital loopback test
&G0	Disable guard tone†	&V	Display current configurations
&G1	Enable 550Hz guard tone	&W0	Store the active profile in NVRAM profile 0
&G2	Enable 1800Hz guard tone	&Y0	Recall stored profile 0 on power up†
&K0	Disable DTE/DCE flow control	&Z <i>n</i> = <i>x</i>	Store dial string <i>x</i> (to 34) in location <i>n</i> (0 to 3)
&K3	Enable RTS/CTS DTE/DCE flow control†		

† - default setting

### ***MNP, v.42 and v.42bis AT Commands***

%C0	Disables data compression	\N0	Normal speed buffered mode
%C1	Enable MNP5 data compression	\N1	Direct data link mode
&Q0	Same as \N0	\N2	v.42 or MNP mode only
&Q5	Same as \N3	\N3	v.42, MNP or normal mode only†
&Q6	Same as \N0	\N4	v.42 mode only
		\N5	MNP mode only

† - default setting





### ***Fax Class 1 Commands{xe "Fax commands"}***

+FCLASS= <i>n</i>	Service class	+FTH= <i>n</i>	Transmit data with HDLC framing
+FRH= <i>n</i>	Receive data with HDLC framing	+FTM= <i>n</i>	Transmit data
+FRM= <i>n</i>	Receive data	+FTS= <i>n</i>	Stop transmission and wait
+FRS= <i>n</i>	Receive silence		





## Specifications

### Dimensions{xe "Dimensions"}{xe "Weight"}

Height x Depth x Width: 17.3 x 18.4 x 7.5" (441 x 469 x 191mm)

Weight: typical: 24lbs (10.9kg), maximum: 30lbs (13.6kg)

### Power Supply{xe "Power supply"}

200W power supply, switchable voltage:

- 115VAC (100 to 127VAC): 47 to 63Hz, 3A
- 230VAC (200 to 240VAC): 47 to 63Hz, 2A

### Environment{xe "Temperature"}{xe "Humidity"}{xe "Altitude"}

	Operating	Non-operating
Temperature	32 to 95°F (0 to 35°C)	-4 to 140°F (-10 to 60°C)
Humidity	20 to 80% (non-condensing)	10 to 90% (non-condensing)
Altitude	0 to 10,000feet (0 to 3,000m)	-200 to 30,000feet (-60 to 9,090m)

### Processor Module{xe "Processor"}{xe "CPU"}{xe "Cache memory"}{xe "L1 cache memory"}{xe "L2 cache memory"}{xe "Pentium III processor"}{xe "SEP"}{xe "SECC"}{xe "SECC2"}

The processor module is installed into a 242-contact slot connector on the motherboard. Processor modules are available in three packages:

- Single Edge Processor (S.E.P.) package
- Single Edge Contact Cartridge (S.E.C.C.)
- Single Edge Contact Cartridge 2 (S.E.C.C.2.).

This slot connector supports Intel® Celeron®, Pentium-II® and Pentium III® processor modules. The module contains Level 1 and Level 2 cache memories.

### Architecture{xe "System controller"}{xe "AGP"}

The processor module connects to the chipset that controls the rest of the computer via a 100MHz system bus. The Intel 440BX chipset includes the system controller, and interfaces to the AGP 2x video bus and the PCI expansion bus.



**Memory{xe "Memory"}{xe "DIMMs"}{xe "SDRAM"}**

Three DIMM sockets that accept 100MHz (or faster) unbuffered SDRAM modules with 32, 64, 128 or 256MB of memory. The DIMM modules must be gold-plated, with 144 pins and use 3.3V.

**Audio**

PCI {xe "Audio"} Yamaha YMF740 3D audio controller with 32-voice wavetable

**Expansion Buses**

AGP: one 2x AGP slot (used by graphics card)

PCI: four slots (one shared with ISA)

ISA: two slots (one shared with PCI)

**Integrated Ports{xe "Connectors"}**

**Audio:** Stereo line in, Stereo line out, Microphone in

**Keyboard:** PS/2-compatible connector

**MIDI/Game Port:** supports standard game devices such as joysticks and game pads. When MIDI software is loaded, the port also supports MIDI devices.

**Mouse:** PS/2-compatible connector

**Parallel:** 25-pin, female D-shell connector, multimode parallel interface, supports output only, bi-directional, ECP and EPP modes

**Serial:** two 9-pin, mini-DIN connector, high-speed, 16550-compatible RS232C

**USB:** two connectors for USB devices

**Video:** 15-pin, female D-shell, VGA connector

**Diskette Drive{xe "Diskette drive"}{xe "SuperDisk drive"}**

The computer has one of the following diskette drives:

- 1.44MB, 3.5" diskette drive accepts DD (720KB) or HD (1.44MB) diskettes
- LS-120 (SuperDisk) drive accepts DD (720KB), HD (1.44MB) or SD (120MB) diskettes.

**Hard disk{xe "Hard disk drive"}{xe "S.M.A.R.T."}**

UltraATA/33 drives with S.M.A.R.T. technology to predict drive failure. 4.3 and 8.6GB: 5400 rpm; 10.2, 13.6, 20.4 and 28.5GB: 7200rpm.





**Optical Drive{xe "Optical drive"}{xe "CD-ROM drive"}{xe "DVD drive"}{xe "CDR-W drive"}**

- The computer has one of the following optical drives:
- Acer 40x (max.) CD-ROM drive with ATAPI interface, supports audio CD, CD multisession, CD-i, Photo CD, enhanced CD, CD-R and CDR-W
- Sony CRX100E/CH 4x (max.) write (CD-R), 2x (max.) write (CDR-W) and 24x (max.) read CDR-W drive with ATAPI interface, supports audio CD, CD multisession, CD-i, Photo CD, enhanced CD, CD-R and CDR-W
- Hitachi GD-2500 BX 3<sup>rd</sup> generation DVD-ROM drive with ATAPI interface, supports 24x (max.) CD access, including audio CD, CD multisession, CD-i, enhanced CD, CD-R and CDR-W; supports 6x (max.) DVD access, including DVD-5, -9 -10 and -18 disks

**Video{xe "AGP"}{xe "Video"}{xe "MPEG-2"}{xe "Refresh rates"}{xe "Video:memory"}{xe "ATi video card"}{xe "Resolution"}{xe "Colors"}**

The computer has one of the following AGP graphics cards:

	<b>ATi XPERT 98</b>	<b>ATi XPERT 128</b>
Graphics controller	64-bit ATI 3D RAGE PRO TURBO	128-bit ATI RAGE 128
Video memory	8MB SDRAM	16MB SDRAM
DVD MPEG-2 decoder	software	hardware
Maximum colors	16.7 million	16.7 million
Maximum refresh rates		
640 x 480	200Hz	200Hz
800 x 600	200Hz	200Hz
1024 x 768	150Hz	180Hz
1280 x 1024	100Hz	125Hz
1600 x 1280	85Hz	85Hz



**Modem (option){xe "Modem"}**

PCI WinModem card supporting line speeds up to 56kbps (download) and 33kbps (upload) with error correction and data compression:

- ITU-T v.90, v.34+, v.34, v.32bis, v.32, v.29, v.27ter, v.23, v.22bis, v.22, v.17 data transmission; Bell 212A and 103 modes
- ITU-T v.80 videophone
- ITU-T v.70 DSVD
- ITU-T v.42 LAPM and MNP2, 3 and 4 error correction
- ITU-T v.42bis and MNP5 data compression
- Fax send and receive using ITU-T v.17 (14,400bps), v.29 (9600/2400bps), v.27ter (4800/2400bps) and v.21 channel 2 (300bps) protocols, and the EIA 578 Class 1 AT command set.

**Network Card (option){xe "Network card"}{xe "Ethernet card"}{ XE "LAN:card" }**

If installed, the PCI network card will be one of the following:

- SMC EZ Card SMC1211TX 10/100BaseT Fast Ethernet card with Wake on LAN support
- Intel Pro 100+ Management Adapter card.

**Tape Drive (optional){xe "Tape drive"}{xe "20GB tapes"}**

Seagate TapeStor Travan 20 STT220000A drive with ATAPI interface; 20GB capacity with data compression; backup speed up to 120MB/min (uncompressed)

**Zip Drive{xe "Zip drive"} (optional)**

Zip drive with ATAPI interface accepts 100MB Zip disks





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## Regulatory Notices

### ***FCC Emission Notices For Users in the USA***

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of FCC Rules. These rules are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to correct the interference with one or more of the following measures:

- Reorient the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits.

Caution: unauthorized changes or modifications may void the user's right to operate the equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### ***FCC Emission Notices For Users in Canada***

This Class B digital apparatus meet all of the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet Appareil numerique de la class B respecte toutes les exigences du reglement sur le materiel brouilleur do Canada.





## **Part 68 Notices**

This equipment complies with Part 68 of the FCC rules. On the back of this computer is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. If requested, this number must be given to your telephone company.

The REN is used to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of all RENs of all devices should not be more than five (5.0). To be certain of the number of devices you may connect to your line, as determined by the total number of RENs, you should call your local telephone company to determine the maximum number of RENs for your calling area.

If the telephone company suspects a problem with your telephone line is related to an add-on electronic device, such as your modem, they have the right to temporarily suspend your service. It is your responsibility to remove from the telephone line any malfunctioning electronic communications equipment to avoid damage to the telephone system.

If your equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you first. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes to its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

If you experience trouble with this telephone equipment, please contact your place of purchase for information for obtaining service or repairs.





### ***Laser Compliance Statement***

The optical drives used in the computer are laser products. The optical drives' classification labels are located on top of the drives.

CLASS I LASER PRODUCT  
LASER KLASSE I  
LUOKAN I LASERLAITE  
APPARER A LASER DE CLASSE 1  
KLASS I LASER APPARAI

The optical drives are certified in the US to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter 3 for Class 1 laser products.

In other countries, the drives are certified to meet the requirements of EN60825.

**Caution:** Do not open the drive; no user adjustments or serviceable parts are inside. Use of the controls, adjustments or the performance of procedures other than those specified may result in hazardous radiation exposure.

Class 1 laser products are not considered hazardous. The optical drives have an internal, Class 1 (1), 0.5 milliwatt, aluminum-gallium-arsenide laser that operates at a wavelength of 760 to 810 nanometers. The design of the laser system and the optical drives ensure that there is no exposure to laser radiation above a Class 1 (1) laser during normal operation, user maintenance or servicing conditions.

### ***Declaration of the Manufacturer or Importer***

We hereby certify that this product is in compliance with EU Directive 89/336/EEC, using the EMC standards EN55022B.

### ***Product Safety Compliance***

This equipment meets or exceeds requirements for safety in the US (UL 1950), Canada (CSA C22.2 No. 950-95), and Europe (TUV to EN60950).

